J. RUSSELL SMITH

HUMAN USE GEOGRAPHY

BOOK ONE

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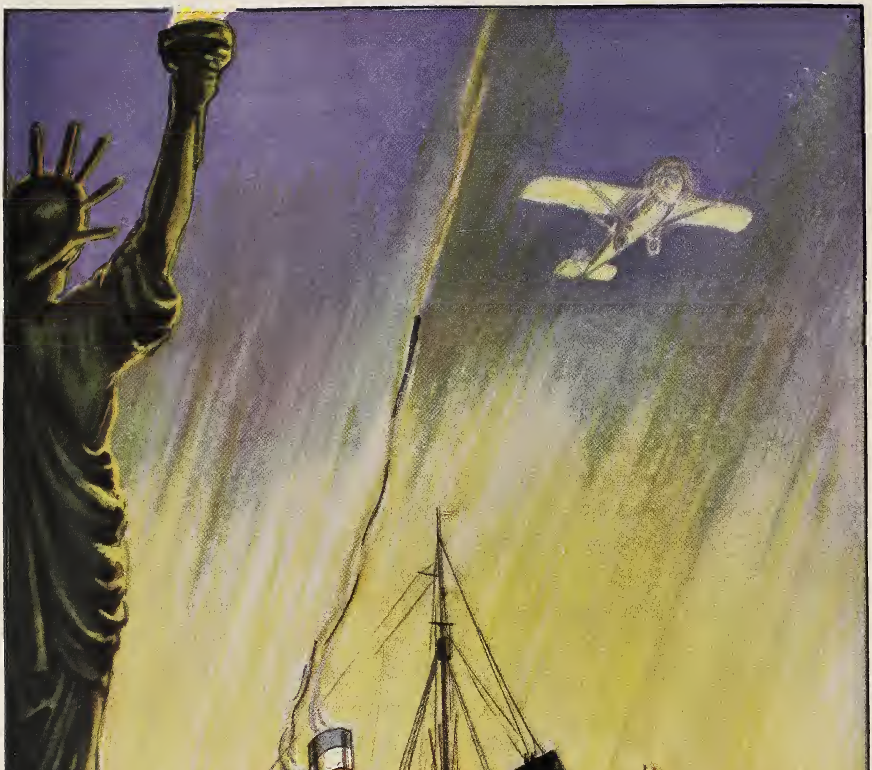

In the fore part of this book we will go on many journeys to distant lands and will cross the seas in a big steamer like the one in the picture. The small sailing ship is the kind used many years ago by Columbus and the people of his time. The larger sailing ship is one of the famous American clippers that carried goods and people over the seas before the general use of steam. Airplanes now sail through the air carrying people, freight, and mail to all parts of the world.

HUMAN USE GEOGRAPHY

BY

J. RUSSELL SMITH, Ph.D., Sc.D.

PROFESSOR OF ECONOMIC GEOGRAPHY, COLUMBIA UNIVERSITY

AUTHOR OF

"Home Folks," a Geography for Beginners; "World Folks"; "American Lands and Peoples"; "Foreign Lands and Peoples"; "Our Industrial World"; "North America"

BOOK ONE

Types of Peoples and Places **Journeys in North America**
Our Beginnings as a Nation
The United States and Its Possessions
The Northlands: Canada, Newfoundland and Labrador Greenland and Iceland
The Southlands: Mexico, Central America, the West Indies

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TO TEACHERS

THE PLAN OF THIS BOOK — *SINGLE-CYCLE — PLUS*

This book is the first of two volumes called HUMAN USE GEOGRAPHY. The plan may be called *Single-Cycle — Plus*. *Single Cycle* means that the two books cover the entire world *once* as thoroughly as the space permits. The *plus* part is to be found in the first part of this book, where *type studies* of the world are presented, and in the last part of Book II, where a special study of the United States with regard to its world relationships is presented.

TYPE STUDIES

The first part of Book I gives an introduction to the systematic study of countries by presenting a series of rather detailed studies of *type places* or type regions. These places, or regions, were chosen because they are interesting and because they are important geographic types. In presenting a few chosen types, enough space is gained to permit us to teach facts about *man* and his *life experiences* as well as facts about the earth. In this spirit the introductory part of the book was designed and written. After all, school geography is primarily and necessarily the study of man as he works with and upon the land on which he lives.

MAKE STORIES TELL FACTS

The material in the type studies is largely in story form. There are also many stories in the latter part of the book. Stories are the best vehicle for presenting the elements of geography, and they make possible a pleasant informality in style. Read the stories thoughtfully, however, and you will observe that while they describe certain lands and the life in them, the stories are also replete with facts, definitions, and concepts which make the type studies a real introduction to the more formal study of geography that will be undertaken in the latter part of the book.

This type study, while postponing systematic presentation of countries, gives space that enables us to present a wealth of factual material about the appearance of the people, their habits and customs, their clothing, occupations, products, trade, transportation, plant and animal life, and features of the land. This material, while rich in factual content, is woven into an interesting narrative. Thus, as the stories develop, there is created an impression of life and living, which I hope will make all people seem like human beings and neighbors.

THE GEOGRAPHY TEACHER'S OPPORTUNITY

The young people whom we teach *must* live in this, our world. They will strive to stay in it as long as they can; and to us, the teachers of geography, is reserved the privilege of making them acquainted with their world and its peoples — their neighbors. As we think of this task, we see it as a great opportunity to bring understanding so that more coöperation may increase welfare and happiness among men.

HUMAN OBJECTIVE AND ENVIRONMENT

Perhaps we shall be better teachers if we keep ever in mind three things: first and always, that we are studying about *people;* second, that every people is in a *place;* third, that all peoples are using the resources of their places, and in so doing they meet problems and try to solve them. Everywhere man has the same life objectives. He attains them more or less completely in lands that are forested, bare, hot, cold, wet, dry, low, high, rich, poor.

Besides presenting the necessary *facts* of geography, I have striven to give the reader some *feeling* for each environment: for the stifling, wilting heat of the humid tropic lowland which makes me feel so weighed down with life while I am in it; for the sense of vigor and strength that came to me as I climbed up to the coffee plantations on the cooler slopes above the hot lowlands.

I have this objective in view as I tell of my experiences with the men who cut tropic sugar cane; who grow vegetables on the sandy Atlantic Coastal Plain; who irrigate the western valleys; who chop trees on mountain sides; who tend sheep that browse above the timber line; who risk their lives in mines from which I was thankful to escape in safety; who tend roaring machines in dusty steel plants.

MY OWN BEGINNINGS IN GEOGRAPHY

My experience with geography began at my mother's knee. I remember telling my mother one winter morning the remarkable facts that Guatemala City was the capital of Guatemala, that San Salvador was the capital of El Salvador, and that Tegucigalpa was the capital of Honduras. I remember the almost microscopic map on which one country was yellow, one was red, and one was green. The cities looked like small spiders. I was impressed by the resemblance between the names of the countries and their capitals; and Tegucigalpa seemed ridiculous because it made me think of a goose galloping. We should never lose sight of the fact that the early impressions of geography are vivid and lasting.

My experience in teaching geography began with a class in the sixth grade. Next came two years of intensive study of a concrete problem in applied geography. The Isthmian Canal Commission (1899–1904) was created by Congress to investigate the problem of building a canal at Nicaragua or at Panama. Where should the canal be built? What would be the cost? What goods would pass through the canal, and what would be the probable income? The two years I spent in helping with this estimate made me acquainted with conditions in nearly all parts of the world, and left me with correspondents in every continent, with files bulging with reports and letters, and with the resolve to devote my life to geography. This resolve kept me for several years in foreign lands, has carried me around the world, and up and down, from snow field and glacier to the tropic lowland where the mosquito net is the most important part of the house, and the quinine bottle sits on the table beside the salt and pepper.

THE PSYCHOLOGICAL APPROACH

By using the psychological approach, scientific explanations, so vital in geography, are introduced at points where they explain a concrete human situation. This accomplishes four objectives at one time: (1) it teaches a principle of geography; (2) it describes a part of the earth; (3) it makes both easier to understand; (4) it makes both easier to remember than if the principle had been presented unrelated to a concrete situation.

Examples of this are New York City, port, harbor, seaport (page 186); formation of sandy soil of the Atlantic Coastal Plain (page 265); alluvial soil and the Mississippi flood plains (page 270); limestone soils and the Southern Black Belts (page 274); air drainage and the fruit industry (pages 278 and 279); what makes a city, and Birmingham (page 293); the sheep herder, the Great Plains, and the Rocky Mountains (pages 305–311); the patch-and-thatch farm and life in the tropics (pages 430-431).

THE USE OF THE TYPE, THE GEOGRAPHIC YARDSTICK

By the method just described we explain a situation. This becomes a type, a kind of unit of measurement for similar situations. This type study becomes a tool for the work of the class and a part of the permanent equipment of the pupil. With a type study mastered, a brief cross reference makes it explain a great industry or a locality in another part of the country or another continent. Thus one type is used to teach quickly a similar type. Tiresome repetition is avoided, and we also have continuous informal review and *comparison.*

TO TEACHERS

LET THE HUMAN STORY TEACH

The parable has been effective teaching technique for many centuries in matters of *wisdom.* But it is equally effective in teaching geography. Therefore many human stories are presented in this book because of their aptness in showing the way man adjusts himself to his environment. Some of these human-interest narratives are: the journey from Maine to Florida (pages 212–216); the variety of resources in Texas (page 250); the jack rabbit and the oil field (pages 285–286); John Marvin's farm (pages 354–363); my day in New York (pages 397–398, 402); Scott McDonald (page 449); Pablo, the Mexican boy of the plateau (pages 473–475).

THE HISTORICAL APPROACH

A marked tendency in the recent development of science is the awareness of interrelationships. The relationship of geography to many other subjects has emphasized the importance of geography, both as a science and as a background for other subjects. History has a geographic setting. To understand the present, we need to know at least two things: the geographic setting, and something about how this geographic setting has been used in the past. The historical approach is presented formally in the chapter beginning on page 227. It will be found also in briefer form in many other parts of this book. See pages 259–260, 313–316, 388–390. I do not consider dates of wars and explorations to be a real historical approach. History, as here introduced, is an *explanation* of how man has used the environment to build up what is now there. See gold rush and gold mining (pages 242–244, 315–316); farming in the Rocky Mountains (pages 318–319).

THE UNIT OF STUDY

The study units have some geographic unity and they are short. In every instance the study unit is immediately followed by self-activity material, and many are preceded by a motivating introduction.

The organization of the part of the book dealing with North America is primarily political. In describing a country and presenting the elements of its geographic background, I emphasize the *dominating* physical and human factors of each region. This gives variety and freshness to every teaching unit because there is such a great variety of conditions in the different parts of the earth's surface.

MAP MINDEDNESS

To make a person *map minded* is one of the desirable results that may be attained by teaching geography. You pick up the morning paper. It speaks of the Amazon River and of the Mackenzie River. Have you a "mind map" of the location of these rivers, and do the names suggest a mental picture of the *kind of place* in which the news event occurred?

In the effort to make people *map minded* and to give *meaning* to the mental maps, this book presents a new kind of map — *a new human-use map.* On the political map (page 218) you will find that the Mackenzie River is in Canada. On the physical map (page 448) you will see the highlands and lowlands that are near it. On the human-use map (pages 168–169) you will find that it is in a great northern forest. On page 454 you will find a living description of this part of the world. Acquaintance with maps gives the pupil mental "pigeonholes" for each new bit of information.

CLASSIFIED KNOWLEDGE

This book classifies knowledge in ways not found in other texts for this grade. A hundred unrelated facts bewilder the mind. When the facts are classified, they assist education and become usable. Cities are important — very important — but in the geography text there is a marked tendency for their presentation to become strings of

unrelated facts. This book classifies cities. Page 293 shows how much easier it is to understand and remember cities when we know that certain cities have certain definite things in common, and therefore fall into groups or classes. Notice the evidence of careful classification of facts in: valley lands in the West (pages 320–337); cities along the Erie Canal Belt (pages 405–408); contrast between the mining town and the irrigation town (pages 316–317, 348); the several types of land in the Southern States (pages 265–281).

THE FUTURE

We study geography today that we may better understand and utilize the world in which we shall live tomorrow — the future. Because of this fundamental objective of education, I have laid especial emphasis upon undeveloped resources and possible lines of future development. For illustration, see: Southern States (pages 300–303); Western States (page 353); North Central States (page 384); also in North Central States (pages 372–373); Northeastern States (pages 428–429); reindeer in northern North America (page 458).

CREATIVE WORK FOR PUPILS

Before using this book, I urge teachers to read the section in the Appendix which tells about making models. Children with manual dexterity revel in such work, and others also profit by it.

THE FLOWING STREAM FOR TEACHERS

A beloved and successful professor was once asked why he spent hours each week in his study reading up on the subject of his courses when it was already well known to him. "I need to know much more than I can teach in the class time," he said, "and I want my pupils to drink from a flowing stream, not a stagnant pool." For this reason I have put in the Appendix references that may be of value to the teacher and also to the pupil.

ACKNOWLEDGMENTS

It is a pleasure to acknowledge the help I have received in preparing this book.

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J. RUSSELL SMITH

Columbia University
New York City

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Fig. A. On one of our journeys this school year we shall visit the cold, snowy lands of the Far North. The man in the picture makes his living there. He is a hunter and trapper. The skins of valuable fur-bearing animals which he catches he hauls to the nearest trading post on a sled drawn by these strong dogs.

INTRODUCTION

TO THE BOYS AND GIRLS WHO USE THIS BOOK

My dear friends:

You will be studying geography for quite a while, and so will I, for I study it all the time. I find geography a most interesting study, and I hope you also will like it. Since we are all studying geography together, I shall call you "my dear fellow students."

Would you like to know where this geography came from? There is a small building in my back yard which I call my "geography shop." In my shop are many books and magazines, maps, big filing cases full of papers. Here I have a good time studying and writing geography, whenever I can get free from doing other things. There is no telephone in my geography shop, because I do not want to be disturbed. I never receive guests there. But every spring I have two visitors. They do not come to my door; but when I hear their joyful singing in the yard, I go out to welcome Mrs. Jenny Wren, and her husband, Mr. James Wren.

They have a summer home in a little box that I put up under the overhanging roof above the door. For four years in succession the wrens have come back on the second morning of May. Where do they come from? Ah, that is a secret! Even I, who built their house and let them have it rent free, do not know. They talk to me sometimes, but they have not yet told me where their winter home is.

For the first few days in May the wrens sing and carry sticks to build a nest. Then Jenny lays some eggs; and when the little birds are hatched, she and James are terribly busy

Fig. A. My shop, James Wren, Jenny Wren, and their summer home under the eaves.

carrying insects to the nest. Hundreds of insects! Thousands of them! Every time food arrives the children squeal with joy. After a few weeks the little wrens jump out of the nest and fly about the yard. When autumn comes, they are gone. They fly to the southward, where the sun shines and there are still insects to be had. Even the most industrious wren could not find many bugs and worms in my yard in frost time.

People who study birds have been catching them and putting on their legs little bands of metal that tell when and where they were banded. Then they let the birds go free, hoping that someone will find the banded bird and write to the person who banded it.

When a bird flies back and forth from summer home to winter home, we say he *migrates*.

Most of the human race is made up of families, with a father and a mother making a home and taking care of children until the children get big enough to take care of themselves. In fact, the fathers and mothers of children have the same job that Mr. and Mrs. Wren have.

Families of people and families of birds in all parts of the world have a lot of the same wants to meet, but they have to meet them in very different kinds of places and therefore in different ways.

This year, as we study this book, we are going to journey to different parts of the world and see *samples of it in our minds.* We shall learn how people live and make a living in different kinds of lands.

If I had not made a house for Mrs. Wren, she would have had to look out for herself. She might have found a crack somewhere, as one did at my boyhood home, where she found a little crack between the porch roof and the house. She could just squeeze into it and she built her nest there. Another wren found a place where some mortar had dropped out from between two stones in the barn wall. And one wren once made a nest in a pigeonhole of an open desk in a little shanty of a woods office where I sometimes work in the summer.

The eider duck (page 67) has to make her nest in a country where the summer is so chilly that there are no trees and sometimes not even any grass with which to make a nest. So she plucks soft feathers from her own warm breast and makes a soft, warm nest on a cold, hard stone. There she lays her eggs and hatches her babies.

In some places the air is always hot

Fig. A. The white man in the picture is Roger Williams. He lived for some time with the Indians and wrote a book about them. See the poles which support the Indians' houses (wigwams). These wigwams are covered with birch bark. They might have been covered with mats woven by the Indians, or with the skins of animals. One Indian woman is parching corn over an open fire.

and mostly wet, and the land is covered with high trees (Fig. 39-A). In other places it is hot, but there is so little rain that only a little grass grows (Fig. 79-A). In other places the land is covered with snow most of the time. Look at the pictures between pages 53 and 70. You see several kinds of houses. What are they? For which one do you think it would be easier to find the building materials? You see that in all these pictures there is no tree that could be used to make a board. The frame houses are built of lumber brought from some other place. If you live there and cannot buy lumber, you have to use what you have or not have a house.

On pages 79 and 82 we see people living in very open tents. On page 94 they are shown living in mud houses. On page 3 (this page) we see a wigwam with walls of birch bark. On page 38 we see houses without any walls at all. Why so many different kinds of houses, and in what kind of a house do you live? These are some of the many things you will learn as you study this book and take the journeys in your mind to many different parts of the world and find out how people live and make a living there.

Then, when you have finished the journeys, you will be ready for a study of our home land, the United States, and of its neighbors in North America.

I hope you enjoy the journeys and your study of North America as much as I enjoy the pleasure of writing to you.

Sincerely yours,

J. Russell Smith

THE EARTH AND MAPS

FINDING OUR WAY ABOUT THE WORLD

Suppose you had been away from home and had made a new friend whom your people had never seen. On your return you would wish to tell your family about this new friend. It would help you very much indeed if you could show a picture of this strange person. Now suppose you wanted to tell about a strange place, a part of the world that your people had never seen. You would like to show them pictures of that also. We have several ways of making pictures of parts of the world.

Figure 6-A is a picture of a very small part of the world. Point in this picture to a long body of water. It is a lake that men made by building a dam across a stream. The picture does not show the dam. Point in the picture to a bridge that crosses the lake; to a large school building; and, near it, to a running track, a football field, and a baseball diamond. See the goal posts on the football field. Between the football field and the schoolhouse you can also see some tennis courts. The building with the tall smokestack is the power house and heating plant. Point to several roads not far from the schoolhouse. Can you see, in the left side of the picture near the top, another road and some more houses? Where do you think the man was who took this picture? Below the picture is a plan or drawing of the same part of the world as in the picture. Find the lake on the plan and in the picture; the woods.

Figure 7-A is another kind of picture of a part of the world. It shows only the lake, the playgrounds, and the buildings of the school. We call Figure 7-A a map. See how many things you can find in the picture which are also on the plan and on the map. Point out in Figure 6-A a house which you think is the home of a schoolboy named Sam. Take a piece of chalk and draw on the floor of your schoolroom or on the blackboard a map of Sam's schoolhouse and of his football field. Perhaps you can also make a map that shows your own schoolhouse, the school grounds, the road or street that is nearest to the school, one or two other streets, and a few other buildings. Perhaps you can make a little map that shows the house where you live and the streets or roads that you travel over as you come to school.

How large should a map be? Suppose you want the map to show all of that part of the world that you ride over in an automobile in a day. And suppose the map were large enough to show a football field as large as the one in Figure 7-A. How large do you think the map would be? It would be as large as several schoolrooms. It would be a great bother to have so large a map. It would take several people to handle it, and you could not see all of it at

one time. It would also be very costly to make. To get away from these troubles we make maps of different sizes to show the same part of the world. Figure 7-A and Figure 7-B are maps of the same part of the world made in different sizes or *scales,* in the same way that the dolls in Figure 5-A are made in different sizes or *scales.*

All maps are drawn to some scale. If a great distance is shown by an inch of map, the map is small and we say that the scale is small. If a short distance is shown by one inch, the map must be larger, and we say that the scale is large.

Examine the plan or map of a room shown in Figure 8-A. Suppose the room is twelve feet square, and your plan of it is two inches square. Then two inches on your map will show twelve feet of distance. Make another plan of the same room, letting one inch show twelve feet of distance. We have made two maps showing the same room, but the maps are of different sizes, or different *scales.* One has six feet to the inch; one has twelve feet to the inch. This means that when you measure one inch on the map with your ruler, you would measure twelve feet if you measured the floor that the map represents. Perhaps you want to make a map of your schoolroom.

The maps (Figs. 7-B, C, D, and E) are about the same size. Figure 7-B, however, shows a very small piece of the world—only the grounds and buildings of the school. Figure 7-C shows a larger piece of the world; Figure 7-D, a still larger piece; and Figure 7-E, a very large piece of the world indeed. Be sure to read the legend under each map. In Figure 7-B the grounds and buildings of the school can be shown because the scale of the map is large. In Figure 7-E the school and all the borough of Hightstown must be shown by a dot because the scale of the map is small. Your teacher will help you find New Jersey on the map of our country.

Fig. A. These dolls had their pictures taken twice. How tall are they in the top picture? in the bottom picture? Copy and complete the following sentences: The dolls in the upper picture are drawn to a ________ scale than the dolls in the lower picture. The dolls in the lower picture are drawn to a ________ scale than the dolls in the upper picture.

Since we can show many things on maps, there are many kinds of maps. Some maps show the things that nature makes, such as mountains, rivers, lakes, and islands (Fig. 36-A). Find high land and low

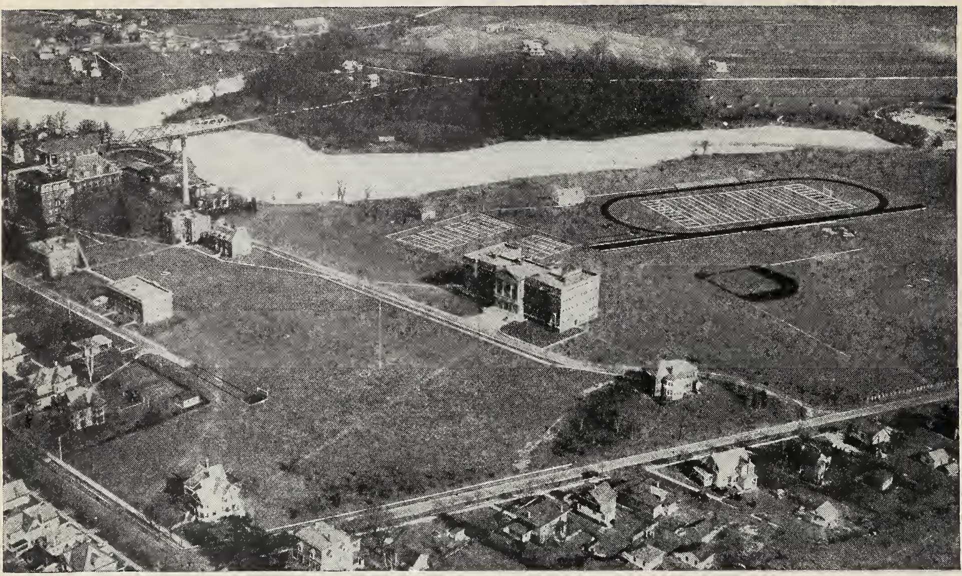


Fig. A. This is a picture of the grounds and buildings of Peddie School at Hightstown in the State of New Jersey. The picture was taken from an airplane as the plane flew over the grounds of the school. Some of the houses of the people who live in Hightstown also show in the picture. Now look at Figure 6-B.

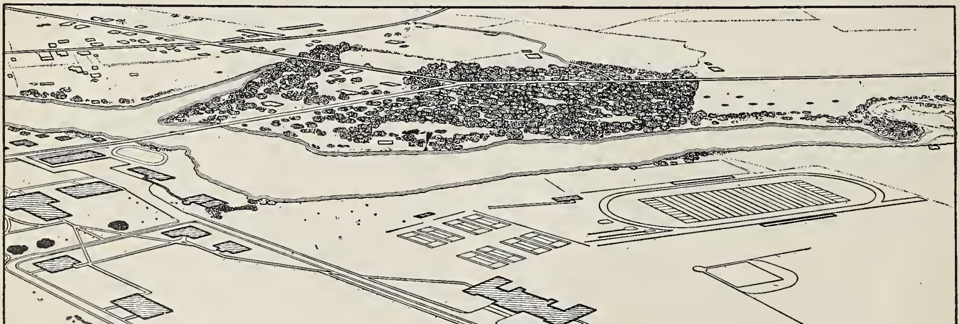


Fig. B. Suppose that the cameraman could have stopped his airplane at the place where he took the picture (Fig. 6-A) and had drawn a plan of the things which he saw. The plan would look like this figure. Make a list of the things you see in the picture which are also on the plan. Now look at Figure 7-A.

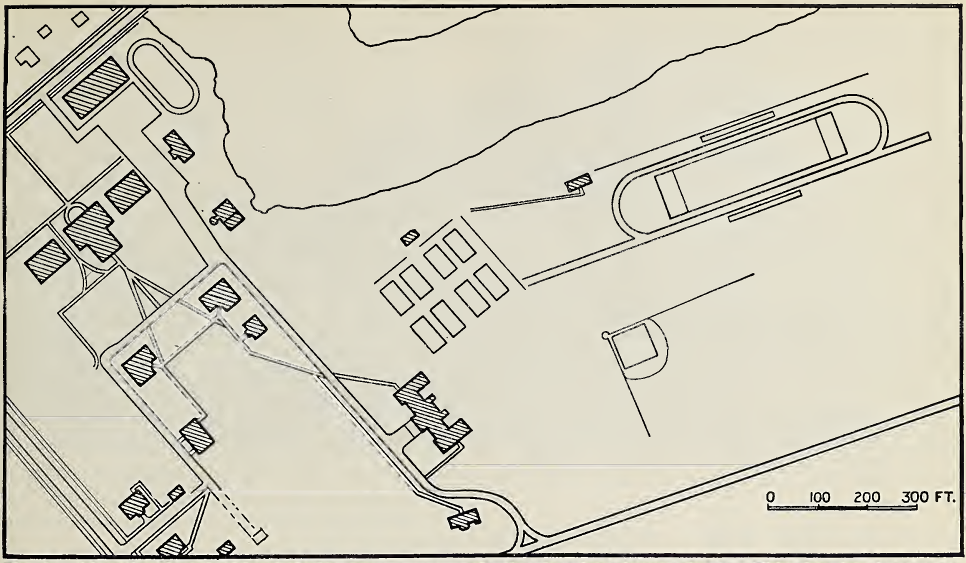


Fig. A. After the plane had landed, the cameraman made the drawing shown above. This drawing is a *map*. The cameraman included in the drawing only the grounds and buildings of the school. Find the football field on the map; on the drawing; and on the air view. Now look at Figure 7-B.

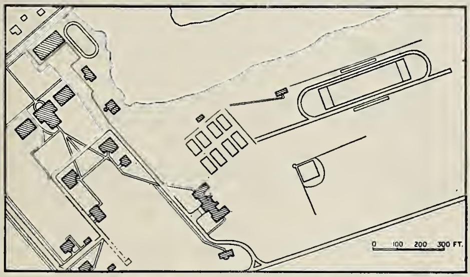


Fig. B. Look at this map and then at Figure 7-A. Are they the same or are they different? These two maps show you something about the *scales* of maps. Tell what it is. Now look at Figure 7-C.

Fig. C. This is a map of the borough of Hightstown. It shows the streets of the borough and Peddie School. Map makers use this method of showing towns or cities on very *large scale maps*. Now look at Figure 7-D.

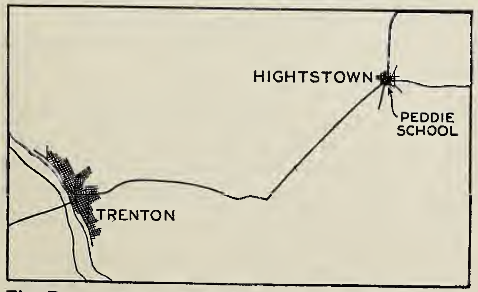


Fig. D. Trenton is a large city near Hightstown. On the map point to Trenton; to Hightstown. Is this map smaller or larger in scale than Figure 7-C? Possibly your father has a road map showing two towns and a road as on this map. Now look at Figure 7-E.

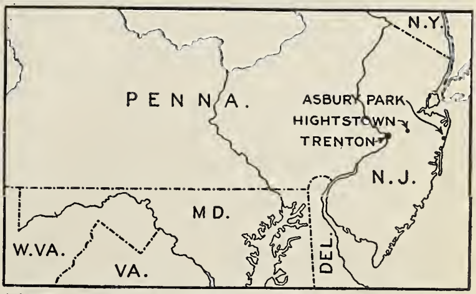


Fig. E. Trenton and Hightstown, as you see from the map, are in the State of New Jersey (N. J.). Because the map maker wished to show the whole State of New Jersey in a very small space, he used dots to locate Trenton, Hightstown, and Asbury Park.

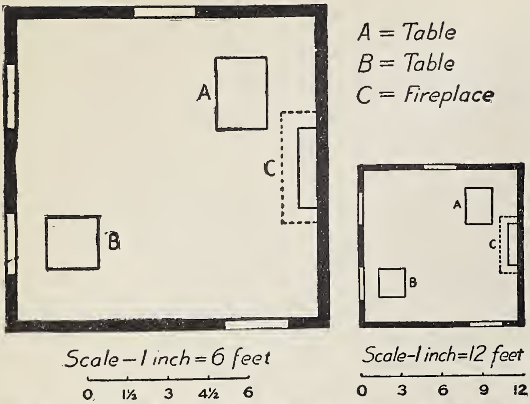


Fig. A. Two maps or plans of the same room. In the larger map, 6 feet of the room is shown by 1 inch on the map. In the smaller map, 12 feet of the room is shown by 1 inch on the map. How long is the room? How wide is the room?

land on this map. Find islands, rivers, lakes. See if you can tell what the map (pages 16-17) tells.

Some maps show the things man has made, such as cities, railroads, and the boundaries of counties, states, and countries. These are called political maps, and on them the different countries often are printed in different colors (Fig. 37-A). Perhaps your teacher will point to two different countries shown on this map, of which you have heard. What separates these two countries? Sometimes a boundary of a country is a river, or a mountain, or a lake. Sometimes it is a line which goes across smooth, level fields and is shown only by markers (Fig. 9-A) in the same way in which a man's land may be separated from his neighbor's land. Did you ever see the corner stones between two lots of land?

People who drive automobiles often carry maps to help them find places which they wish to visit. Figure 9-B is a map for automobile drivers. Tell how such a map would be useful if you were traveling in an automobile in a strange country. If it had been raining for several days, which road in Figure 9-B would you wish not to drive over?

THINGS TO DO OR TO THINK ABOUT

1. Measure with your ruler the width and height of the top of your desk. On a large sheet of paper draw a map of the top of the desk one half size. If the desk has an inkwell and a pencil groove, show the inkwell as a circle and the pencil groove as a long, narrow oblong. On the other side of the paper draw a second map of the top of your desk half the size of the first map. Beneath the smaller map copy and complete the following sentences:

One inch on the first map which I drew shows .... inches of the top of my desk.

One inch on the second map shows .... of the top of my desk.

These two maps I drew to ....

The scale of the first map is .... the scale of the second map.

2. Fill in these blanks: Maps show the things that nature made, such as rivers, ..., ..., ..., ..., ..., ..., and .... Maps also show things man has made, such as States, ..., ..., ..., ..., and ....

3. On a map (Fig. 37-A) find things that nature made and some that man made. See who can make the longest list.

4. Draw a map that shows a mountain, a river, a lake, and an island.

5. Point out the place where you live on the map of the United States (Fig. 184-A); on the map of North America (Fig. 214-A).

6. On the physical map (Fig. 184-A), locate your home. Is the land about it high or low? Find and name the nearest mountains, lake, and river.

7. Show the route from your home to a large city; to two foreign countries (Fig. 178-A).

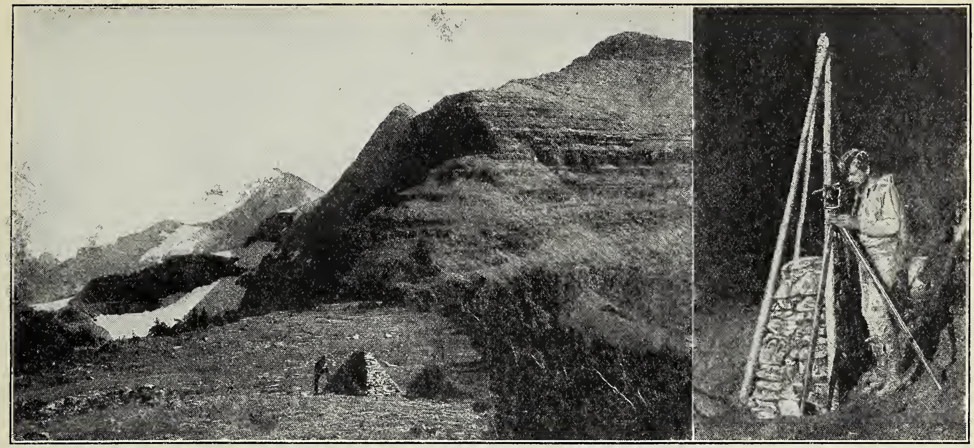


Fig. A. See the pile of stones in the picture at the left. It is a boundary marker. It is placed on the boundary between our country, the United States, and Canada. The man is standing in Canada. The pile of stones in the picture at the right is also a boundary marker between the United States and Canada. This boundary marker is at the place where the states of Idaho and Washington and the country of Canada meet. You can see this place on any map of the United States.

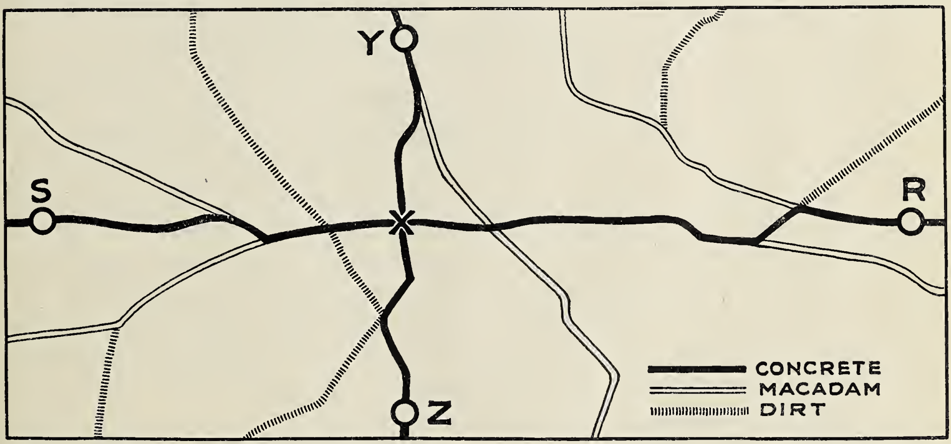


Fig. B. This is a small piece of an automobile road map. Possibly your father will let you see the automobile road maps which he has in his car.

FINDING DIRECTIONS

Now look at Figure 9-B and suppose that your automobile was getting near to the town of *X*. Several roads lead out of this town. How would you tell a person which road he should take to go to a certain place? There are two ways of doing this. When men began to think about this puzzling matter of telling one another how to go to various places, they began by naming their two hands *left* and *right*. Hold up your left hand. Hold up your right

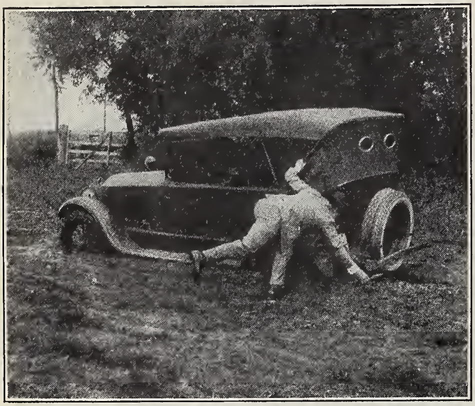


Fig. A. The dirt road shown on the map (Fig. 9-B) looked something like this after a hard rain.

Fig. C. This road is built of concrete. It is like a long stone pavement. Find this kind of road on the map (Fig. 9-B).

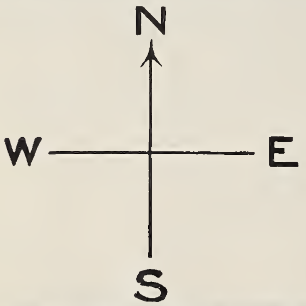


Fig. B. The four main directions as we usually have them on maps.

hand. Point to someone else's left hand. Now point to someone else's right hand. You see, there are two main directions: left direction and right direction. This is useful when someone asks us the way. We can tell him to turn right at a certain place, or to turn left. Of course, you have thought of two more directions: the front direction and the back direction. Point in the *right* direction and then turn around and again point in the right direction. This way of telling direction is not perfectly sure in all cases, is it? We need to have a direction that always stays the same.

The sun helps us to get a direction that always stays the same.

Let the sun shine through your schoolroom window, and at noon there will be a shadow line on the floor, the shadow of the edge of the window. We call that line north-and-south: south toward the sun in our country, and north away from the sun. Take a piece of chalk and mark this north-south line on the floor. That line will always be the same at noon when the sun shines in the window.

You can watch the shadow creep across the floor. Mark the one o'clock shadow line; the two o'clock shadow line. That is the way by which people once told time. Such a sun clock is called a sundial. You might make one on your schoolroom floor, making a mark for each hour.

For a long time men have used that north-and-south sun line to help

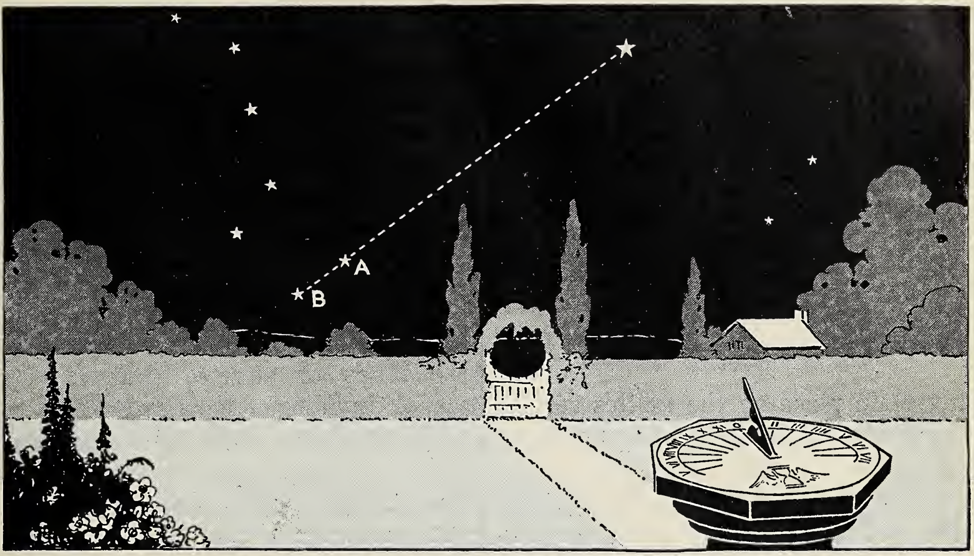


Fig. A. Near the lower right corner of the picture is a sundial. The arm of the sundial points directly north; that is toward the North Star. See the North Star in the picture. See also the "Big Dipper." The "pointers," stars B and A in the picture, point toward the North Star.

them find direction. In the woods on a sunny day a man can get this north-south line and tell the direction in which he is going.

Stand with your back to the sun at noon. When you do this your face points in the direction we call north. Your right hand is at the direction we call east. Your left hand is at the direction we call west.

Find what direction is north from your schoolhouse door; what direction is east; what direction is west. Perhaps each member of the class can tell what direction his home is from the school.

The Indians had a way of telling the north by the stars at night by watching the Great Star, which we call the North Star (Fig. 11-A). Men need something of this sort when traveling in the woods or even on a great level open space. If a traveler does not have anything to guide him, he is almost sure to walk around and around in a big circle without knowing that he is doing so.

The white men have an even easier way than the Indian has of keeping on going in the same direction. They use a compass. A compass is a little needle made into a magnet. Have you seen a magnet, a piece of metal that picks up needles or nails or anything made of iron or steel? We say that the magnet *attracts* the other pieces of metal.

The compass needle is a little magnet so balanced that it can turn freely (Fig. 12-A). Now there is

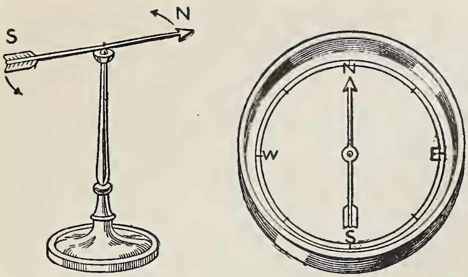


Fig. A. A compass needle on a stand and a compass needle that may be carried in the pocket and used as a guide to directions. The little arrows show how the point of the needle on the stand will turn toward the north.

a certain place on the earth's surface far away to the north of our country that has the same attracting power that a magnet has. It attracts one end of the magnetized needle so that the needle always turns toward this place in northern Canada. No one knows just why the needle always points toward this northern place. You can hold a compass and turn it around, but the swinging needle will point in the same direction all the time. It always points to the north.

You can take your compass out of your pocket on a rainy day in a strange forest, and it will tell you where north is. Men use the compass to find the way when they are on the sea, in the woods, or in wild places. It is very useful, indeed, especially when the sun does not shine.

See the letters on the compass. (Fig. 12-A.) *N* is for north, *E* for for east, *W* for west, and *S* for south. The direction that is halfway between east and south we call southeast (*SE*). What is the direction halfway between west and south? What does northwest mean? northeast? Can you point northeast? southeast?

Now let us see how men use the compass directions in making maps. Perhaps you may draw a map on the schoolroom floor. Let lines show the outside of the school grounds and the roads or streets. Let the lines point in the same directions as the edges of the grounds and the roads or streets. Put in the school building. Now lay a piece of paper down beside this map and copy it on the paper with a pencil that makes heavy lines. Be sure you understand this plan or map. Point out the various roads or streets.

Which side of the paper is south? Mark on your paper map as it lies on the floor an arrow pointing north. North on the map is then also north in the room and north out of doors. Hang the paper map on the north wall. Hang it so that the north side of the map is toward the ceiling. Map makers usually put the north at the top of the map, so we shall hang ours that way. You see the east is on the right, the west is on the left, the south toward the bottom.

Now take the map down and lay it on a table or desk. Point on the map to the south; to the west. Turn the map part way around and again point out the directions *on the map*. Lay it on the floor in a new place. Hang it up on the side of the room opposite the place where

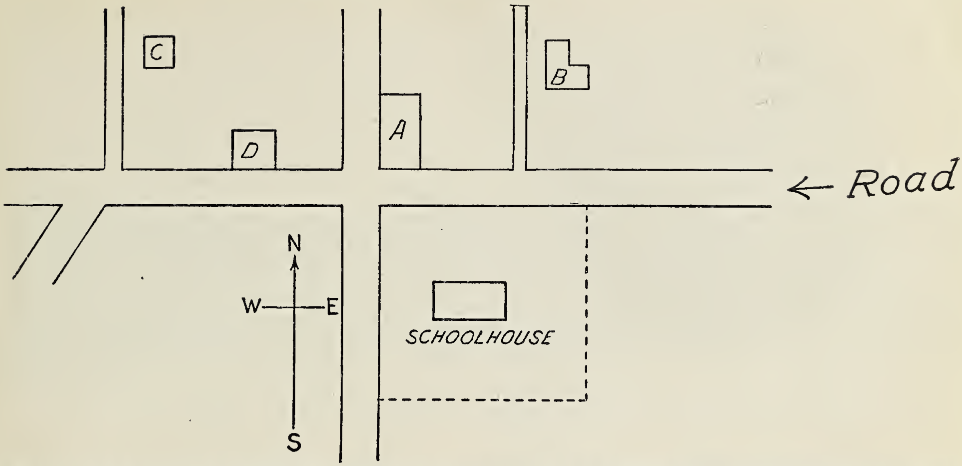


Fig. A. This is a map of a neighborhood near a country school. A is a store; B, the storekeeper's house, C, the teacher's house; and D, the bank. Tell the direction of the two main roads. The map is drawn to the scale of one inch equals one hundred feet.

you first hung it. Be sure you understand the directions *on the map* as it hangs in each of these places, because knowing map directions will help you greatly in all your study of geography.

Now look at Figure 9-B. Your automobile is coming near the town *X*. It is coming on the road from *R*. In what direction is your automobile going? When you get to *X*, the next town will be *Y*. What direction will you go from *X* to *Y?* If you had been going to *Z*, in what direction would you travel from *X* to *Z?*

THINGS TO DO OR TO THINK ABOUT

1. Copy and complete the following sentences:

(*a*) My school is dismissed for lunch at ....

(*b*) If I hurry to the yard and face the sun, I shall be looking toward the ....

(*c*) If I raise my right hand, I shall be pointing toward the ....

(*d*) If I raise my left hand, I shall be pointing toward the ....

(*e*) .... will be in back of me.

2. Write a short story about "The Compass, the Traveler's Friend."

3. Tell the class how you go home from school — in what directions. For example, "I go south for two blocks, or for half a mile, then turn .... or ...." — and so on. As you give the class directions for reaching your home, ask someone to make a map of the directions on the blackboard.

4. The following parts of sentences are all about directions. Copy and complete each sentence.

(*a*) My school faces toward the ....

(*b*) The windows in my schoolroom open toward the ....

(*c*) My house faces toward the ....

(*d*) The windows in the room in which I sleep face toward the ....

(*e*) The street on which our school fronts runs from .... to ....

(*f*) I must remember, however, that when I am looking at a map
north is toward the ....;
south is toward the ....;
east is toward the ....;
west is toward the........

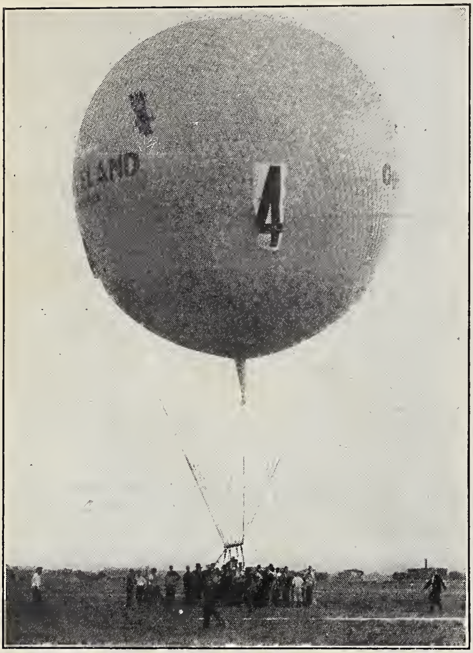


Fig. A. The earth is shaped something like this balloon. If an ant were walking on the balloon, the balloon would appear to be flat because the ant could see so little of the balloon. In the same way, the earth appears flat to us because we can see so little of it.

THE SHAPE OF THE EARTH

We can see so little of the world at any one place that for a long time men thought the earth was flat. We can see that the moon is round, but if we were on the moon it would look as flat to us as the earth does. Look at an apple or a ball through a tiny hole in a piece of paper held close to it, and you will see that a tiny part of even so small a round thing looks flat. The ant on top of the big balloon was sure that the balloon was flat, much flatter than the garden where he lived. The ant could see so little of the balloon that it looked flat to him. But men could easily see that it was round. The earth looks flat to us, just as the balloon looked flat to the ant. But the earth is round, rounder even than a balloon. It is, indeed, almost a perfect ball or sphere.

If a man on the moon looked at the earth, it would look as round as does the full moon to us. This book has four pictures that show us how the earth would look to a person far enough away in the sky to see the whole of one side of it. (Fig. 16-A, 17-A.)

I have traveled all the way around the world. Many people have done this. This shows that the earth is not flat. You can easily see how an ant or a fly on an apple, by going straight ahead, can walk around the apple and thus come back to the place from which he started. If one travels on a line around the middle of the earth, it is twenty-five thousand miles. If you could walk right around the earth and walked at the rate of ten miles a day, it would take you nearly seven years; but an airplane, going one hundred miles an hour, would go around in less than eleven days.

By going to the seashore, we can see with our own eyes that the world is not flat. As a ship sails away from the land, we see at first the whole ship. Then it seems to sink out of sight, till at last we see only the tops of the masts or sails, or the smoke from its smokestack. Often a person on the seashore can see the smoke that rises from a

Fig. A. What parts of the ship that is farthest away from the land do you see? After you have read the story, tell why ships disappear as they sink behind the rounded surface of the sea. See the lighthouse on the point of land or cape. See the buoys which mark the channel.

ship's smokestack when the ship itself is entirely out of sight below the *horizon*, the place where sea and sky seem to meet. As a ship comes in, on the other hand, it gradually rises into sight over the curve of the sea (or earth), until at last, as it comes nearer, we see the hull or body of the ship. This is much like two ants peeping at each other over the top of a baseball (Fig. 15-B). Each sees the other's head first, while the curving surface of the ball still hides their feet.

THINGS TO DO OR TO THINK ABOUT

1. If an airplane traveling 100 miles an hour can circle the earth in a little less than 11 days, about how many miles is it around the earth? Check your answer with the figures given in the story.

2. Which of these words belong in each of the blanks below?

moon	horizon	hull	sphere	flat
saucer	twenty-five	thousand	miles	

(*a*) The place where the earth and sky seem to meet is called the ....

(*b*) The earth is round like a ....

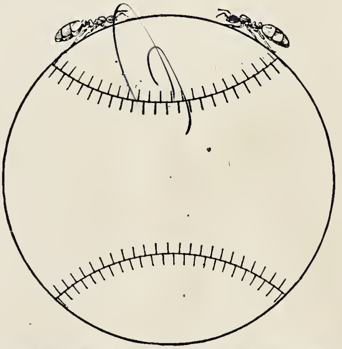


Fig. B. What part of one ant does the other ant see first as they approach each other on the baseball?

(*c*) A baseball is round like a ....

(*d*) The body of a ship is called the ....

(*e*) Sometimes at night we see the .... in the heavens. It is round like a .... To us, however, it appears to be round like a .... If we landed on the moon it would appear to be ...., as does the earth.

(*f*) The distance around the middle of the earth is ....

3. Suppose a bird should light on the top of the balloon (Fig. 14-A). He sees an ant on the balloon. The ant is nearsighted and can see only a hundred times as far as the length of his own body. The bird can see for miles. What might they say to each other?

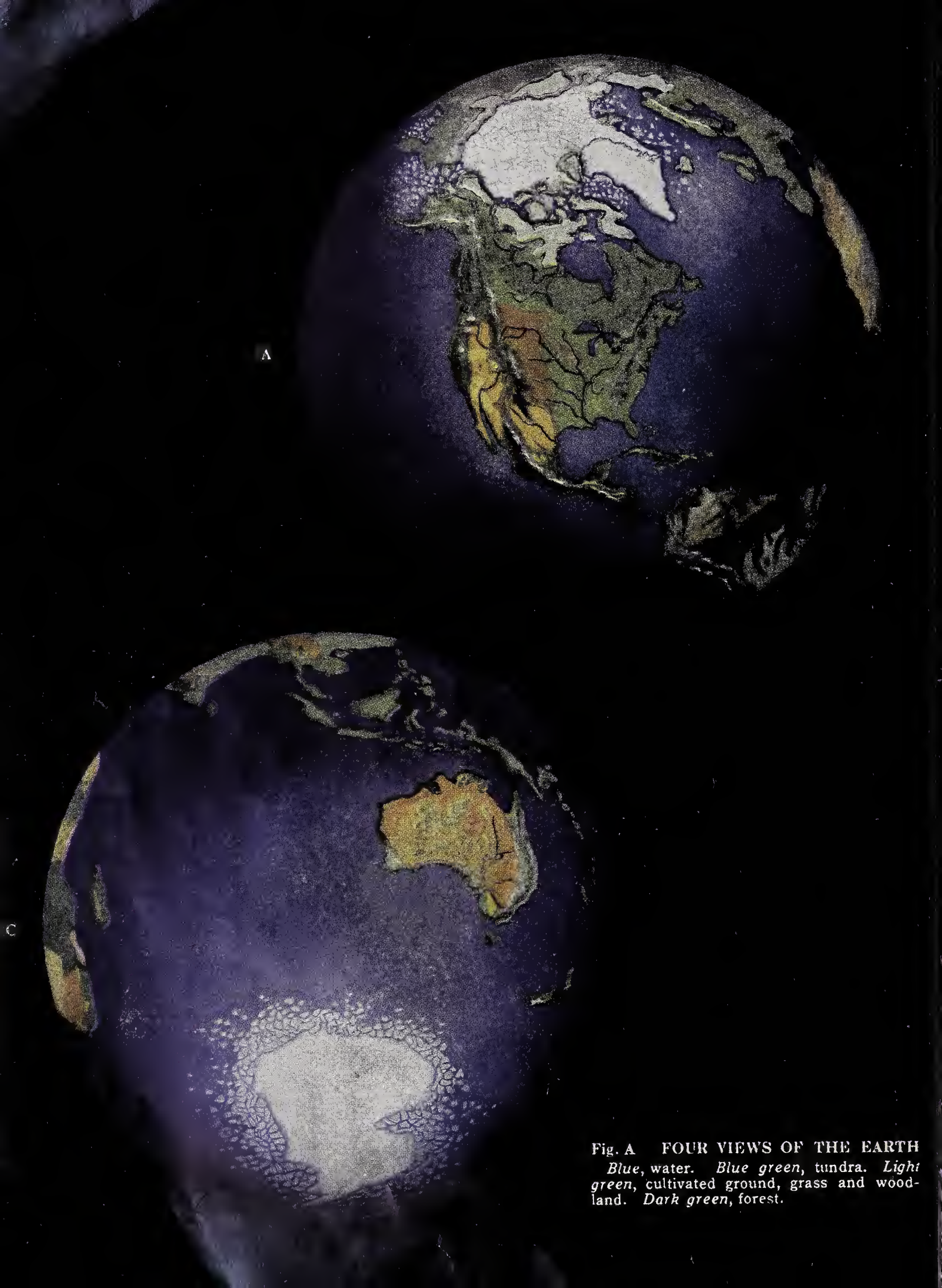
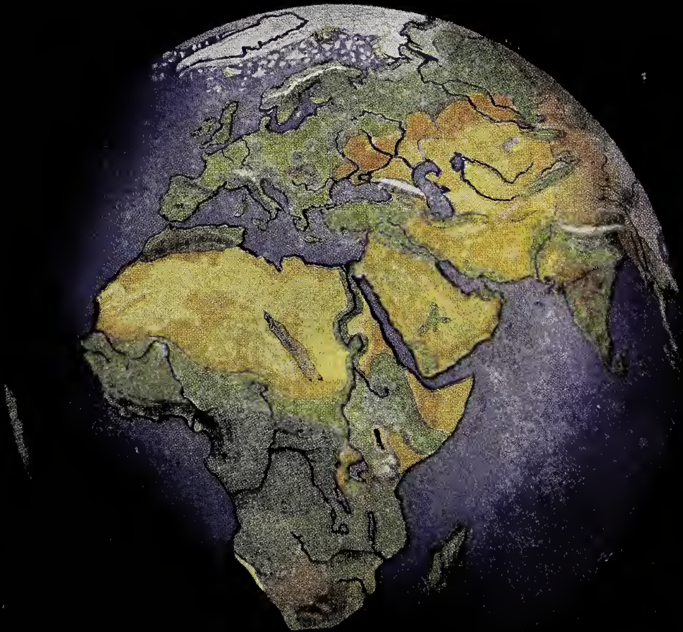


Fig. A FOUR VIEWS OF THE EARTH
Blue, water. *Blue green*, tundra. *Light green*, cultivated ground, grass and woodland. *Dark green*, forest.



B

D

AS SEEN BY THE MAN IN THE MOON

Yellow, desert. *Light brown*, semi-desert and poor grassland. *Dark brown*, grassland. *White*, snow and ice.

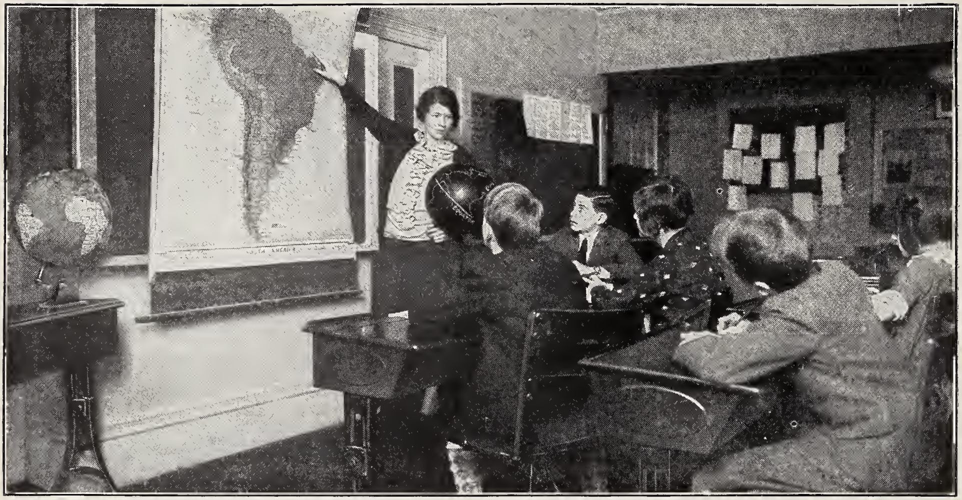


Fig. A. There are two kinds of maps in this classroom. The teacher is holding one kind in her left hand. Name it. Find a second globe in the room. The teacher is pointing toward another kind of map. It is a flat map of a piece of the earth called South America.

Fig. B. This picture of the globe has been made much larger so that you can see it better. Suppose you turned this globe in such a way as to make what we call sunrise. In which direction would North America move?

THE ROUND MAP OR GLOBE

Here is a thing that has puzzled men for a long time. How shall we make a map that shows us the round world? The best map of a round world is made on a ball, because a ball is round like the earth. Such a round map we call a *globe.* We mark off on its surface the land regions and the water regions of the earth's surface. Three fourths of the surface of our earth or globe is water — the great sea — with bodies of land sticking out here and there. The parts of the sea which are divided from each other by the land are called *oceans.*

If you look at a globe or map of the world (Fig. 18-B), you will see that all the oceans are connected with one another by water. Thus ships can sail from ocean to ocean, and go all the way around the

world, as they often do. You will also see that the land is divided into many, many parts. Some of these parts, or bodies of land, are large, and some are small. The smaller parts are called *islands*. No one knows how many thousands of islands there are in the world. They have never been counted. No map can show them all. Some islands are only bare rocks, no bigger than tables. Some are large enough to have a few trees on them. It would take you only an hour to walk around some islands. Others are so large that you could walk for days and weeks and not come to the ends of them.

The seven largest bodies of land we call *continents*. Pick out these largest bodies, or continents, on a globe or on a map. (Fig. 178-A.) The continents are North America, where we live, South America, Europe, Asia, Africa, Australia, and Antarctica. (Fig. 19-A).

The oceans are separated from one another by the continents. Long ago the sailors gave different names to different oceans or parts of the great sea. Point out the oceans on a school globe, if you have one, and also on the map of the world (Fig. 178-A). Perhaps you can find them on Figure 16-A—Atlantic Ocean, Pacific Ocean, Indian Ocean, Arctic Ocean, Antarctic Ocean. Which ocean is nearest your home?

If you do not have a school globe, take a smooth round orange and with pen and ink do the following:

Put on the poles and the equator. Draw in the outlines of the continents. Mark each continent with its initials—N.A., S.A., E., As., Af., Au., An. Now hold your globe so that you look at it and see each of the four views shown in Figure 16-A.

THINGS TO DO OR TO THINK ABOUT

1. If you have a globe in your classroom, point to and name each of the continents.

2. Why do you think that the globe is the best kind of map to use?

3. Choose the right word below to complete each of the following sentences:

(*a*) The continent south of Europe is ....

(*b*) The continent joined to Europe is ....

(*c*) The continents in order of size are ...., ..., ..., ..., ..., ..., and ....

4. Copy the following, filling in the blanks. Keep the map of the world (Fig. 178-A) open before you: North America is between the .... Ocean and the .... Ocean. The .... Ocean is east of South America and the .... Ocean is .... of South America. The Indian Ocean is .... of Asia. The .... Ocean is north of North America.

Fig. A. Here are small pictures of the seven continents which you read about in the story. Name each continent. In which continent do you live?

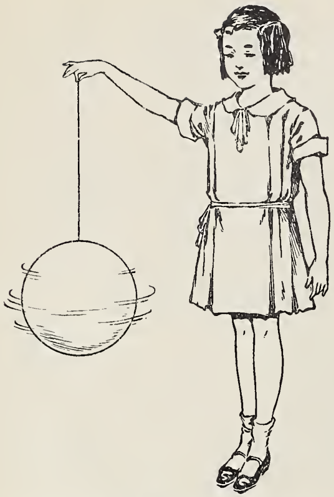


Fig. A. The girl has a basket ball on a cord. She is spinning the ball to show how the earth spins or rotates.

Fig. B. Pretend that the globe in the picture is the earth and that the light streaming in the window is the sun. Point to the part of the earth having day; the part having night. If you were to whirl this globe, what would happen to any place on the globe?

OUR SPINNING WORLD

The earth is moving all the time. You can see how this is if you will tie a string around the stem of an apple, or put a ball on a string as the girl is doing in Figure 20-A. Perhaps a basket ball or a pumpkin can be used. Hold the round object up by the string and spin it. The earth turns around like this once in twenty-four hours. We do not notice the turning motion because everything we see is moving with us.

We have night and day because the earth turns around. You will understand this if you will hold the spinning object in front of a lamp or a bright window. Let the round object spin slowly on the string. Do you see that when one side is in the light the other side is in the shadow? The same thing happens when the earth turns, or revolves. The part of the earth that is turned toward the sun has light. This makes day. The part that is turned away from the sun is in the shadow. This makes night. (Fig. 20-B.)

What really happens at sunrise? We say the sun "rises" in the east and "sets" in the west, but we know now that it is the earth, not the sun, that does the moving. People began saying "sunrise" and "sunset" long, long ago, when even the wisest of men thought the sun did swing around the earth, very much as a ball on a string swings around a boy's hand. In the morning, when the sun seems to be coming up over the edge of the world in the direction to the east, we see it because our particular spot on the earth's surface has turned far enough toward the east so that the sun's light can shine on it. See if you can make

sunrise with a light and an apple on a string.

You see that the apple spins around on its stem. If the stem went all the way through, you could easily see that the apple spins around both ends of the stem. Perhaps you can push a knitting needle, or a piece of wire, or a thin piece of wood through an apple and let the apple spin around this rod. Such a wire or rod may be called an *axis*. We can imagine one in the earth, on which the earth spins around. One end of the earth's axis always points toward the North Star and is called the *north pole*. The opposite end is called the *south pole*. Your teacher will show you the poles on the globe (Fig. 18-B).

If you should get to the north pole or to the south pole, you would see no *pole* or *axis*. The pole is imaginary, but the earth does turn around it just as the apple turns around the imaginary axis. Point out the poles on an apple or on Figure 21-A.

The poles of the earth are very hard to reach. Both of them are very cold and icy. For a hundred years men tried to get to the north pole, but they always failed. Finally, in 1909, Robert E. Peary, an officer of the United States Navy, reached the north pole after many trips and many years of hard work. When he did reach it, he found only an ordinary piece of ocean covered with ice, over which he and the Eskimos walked, while the husky dogs pulled their sledloads of provisions. In 1926 Richard E. Byrd, another officer of our navy, flew over the north pole in an airplane. Three days later Roald Amundsen, a Norwegian, crossed the pole in a dirigible. In 1911 Amundsen had tramped over miles and miles of ice-covered land to reach the south pole. Around this pole there is very high land covered with snow. Byrd flew over it in an airplane in 1929.

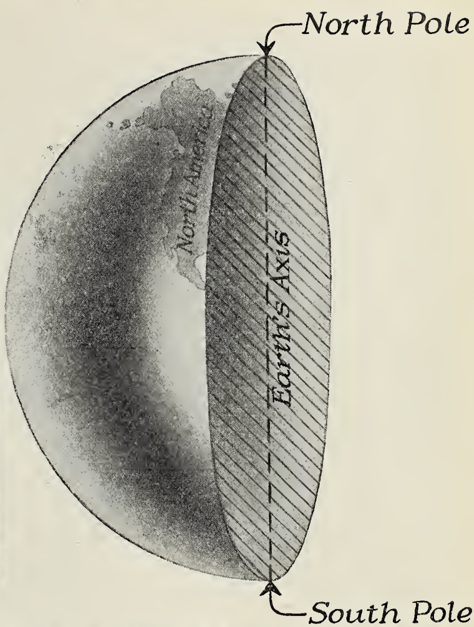


Fig. A. A drawing of a globe cut in two to show the earth's axis and the poles.

We cannot go any farther north than the north pole, nor any farther south than the south pole. If we are going toward the north pole, we say that we are going north. It makes no difference on which side of the world we are, whether we are in Europe, Asia, or Africa, or whether we are one mile or ten

Fig. A. This picture was taken near the north pole. The top of the earth, as you see, is covered with snow and ice. This is many, many feet thick. Beneath it is the Polar Sea.

thousand miles from the pole. If we are going toward the north pole, we are going north; if we are going toward the south pole, we are going south. Point to the north and south directions on your spinning apple, calling the stem end the north pole. Point to the north and south directions on your school globe.

THINGS TO DO OR TO THINK ABOUT

1. Let someone volunteer to tell a story that will explain *day* and *night* to a younger child. Let the class tell why it is a good story, or how it could be made a better story.

2. What is that end of the earth's axis which points to the North Star called?

3. Let the class appoint arctic and antarctic explorers to represent Robert E. Peary, Richard E. Byrd, and Roald Amundsen. Each *explorer* is supposed to find out about the experiences of the explorer he represents and to use the facts in making a five-minute talk before the class. The class will vote for the talk that best shows why arctic and antarctic exploration is so difficult and dangerous.

4. Point to the sunrise part of the sky; the sunset part.

5. Where do you see a globe in the picture (Fig. 18-A)? What is the girl doing with the basket ball in Figure 20-A?

6. In what direction does your shadow point at nine o'clock in the morning? as you walk home from school?

7. With some round object show how the earth moves.

8. Explain the meaning of island, continent, ocean. Find one of each on a map.

9. Why did it take so many years to find the poles?

10. In which continent is China? Mexico? Brazil? Cuba? France?

11. Make up a story about the dogs which you saw in Figure 22-A.

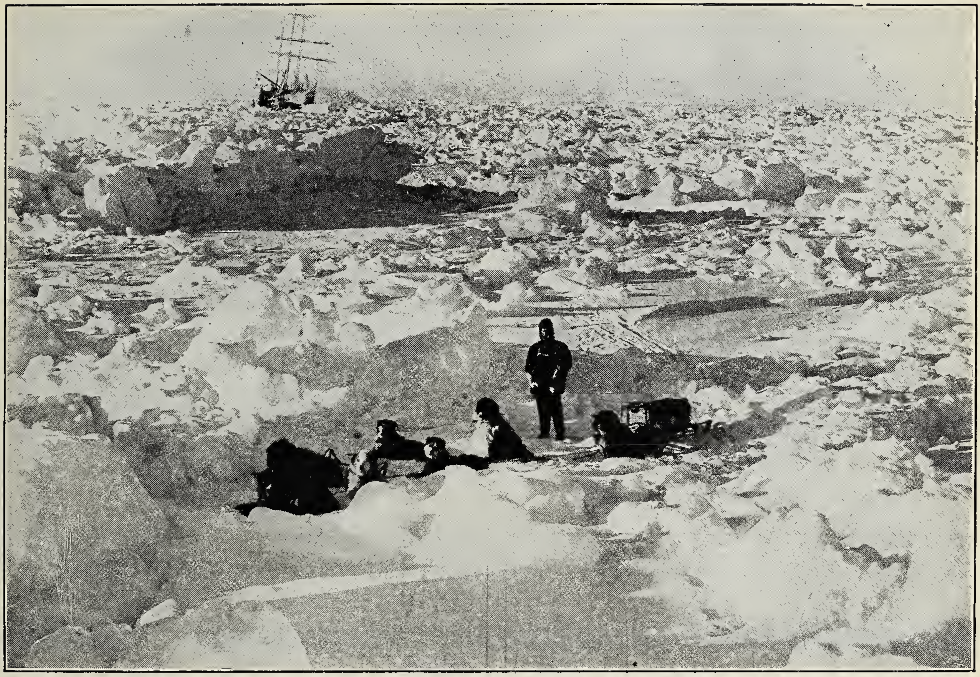


Fig. A. This picture was taken near the south pole. The farthest point south is also covered with snow and ice.

Fig. B. At the edge of the polar ice pack is a great wall of ice higher than the masts of the ship.

Fig. A. The Northern Hemisphere.

Fig. B. The Southern Hemisphere.

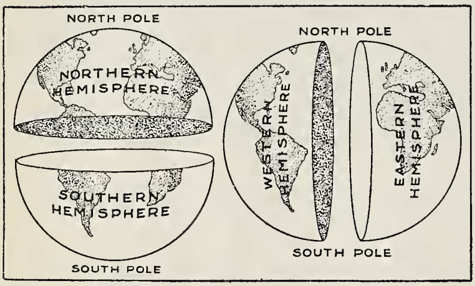


Fig. C. The earth may be divided into hemispheres as shown in these pictures.

DIVIDING THE WORLD INTO HEMISPHERES

There are several ways of talking about the earth or globe. We have already had land and water, continents, and oceans. There is another way. Cut your apple into two equal parts, a north half and a south half. If we could cut the globe in this way, we would have two halves of a globe or sphere, each called a *hemisphere* (*hemi* means "half"). The one with the north pole for its center — the northern half — we call the Northern Hemisphere; the one with the south pole for its center we call the Southern Hemisphere. The line halfway between the poles is called the *equator,* because it is equally distant from the poles. Get a string and tie it around your globe at the equator. The circumference, or distance around the earth at the equator, is about 25,000 miles; the diameter, or distance straight through the center of the earth, is about 8,000 miles. Perhaps you can take pen and ink and mark the poles, the equator, and the outline of one of the continents on an orange or on a new baseball. It will not hurt the orange or the ball. Examine your globe to find out in which hemisphere North America is. In which one is South America? Europe? Australia? Asia? Africa?

We can make several kinds of hemispheres. Now take another apple and cut it in two halves in

Fig. A. The Western Hemisphere.

Fig. B. The Eastern Hemisphere.

such a way that you split the core. In the same way (Fig. 24-C) we could divide or mark off the globe into halves by a string or line running around it and passing through both poles. A long while ago men decided that they would pretend to divide the world into two parts that way by a line in the Atlantic Ocean between Europe and America. The land to the east of that line we call the Eastern Hemisphere, and that to the west we call the Western Hemisphere. In which hemisphere is South America? Africa? Europe?

White men have lived in the Eastern Hemisphere much longer than they have lived in the Western Hemisphere. Because they came from the Eastern Hemisphere to the Western Hemisphere, they called it the New World. The Eastern Hemisphere is often called the Old World. All the people mentioned in the Bible lived in the Eastern Hemisphere. They did not know that there was any America out in the great western sea. They had no safe way of crossing so great a sea.

After a long, long time, someone invented the compass. Then sailors were able to have a clearer idea of where they were as they sailed on strange seas, and they could take longer voyages. Later, another great invention was made. This invention was the art of building a ship so that it could sail against the wind (Fig. 156-A). Then men could cross the ocean without being afraid that they could never get back.

In 1492 a brave Italian named Christopher Columbus started from Spain with some other men to sail across the western ocean. He knew that the earth was round, and that if he sailed far enough he would reach Asia. This would be an easier route for ships trading with the people in India and China than the

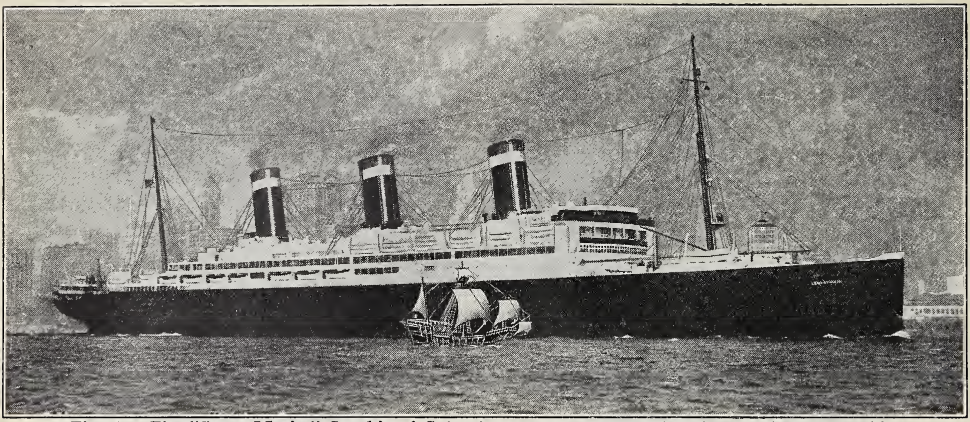


Fig. A. The "Santa Maria," flagship of Columbus, as it would look beside a modern steamship.

long voyage they had had to take before this time. His three ships sailed on and on and on. For seventy days they sailed. The sailors, afraid that they would never again see home, threatened to throw Columbus overboard and to go back. But just as they were about to turn back, they saw land birds, and then they knew that they must be near land. On the seventieth day of the voyage, October 12, 1492, the weary sailors landed on an island, San Salvador, or Watling Island, one of the group we call the Bahamas. Columbus did not know that he had discovered a new continent, but thought he had reached India. Although he made three more voyages to America, he died thinking he had reached India. It was he who called the natives of this country Indians.

The first men to go entirely around the world were some Portuguese sailors. They left Europe in the year 1519. They went westward around the southern end of South America and in three years some of them got back to Portugal.

THINGS TO DO OR TO THINK ABOUT

1. The expressions given below should remind you of something you learned from reading the story. Write one fact about each expression.

continents oceans hemisphere north pole south pole equator northern hemisphere southern hemisphere eastern hemisphere

2. Answer the following questions. Then turn to the hemispheres on pages 24-25 and check your answers.

(*a*) What continents are entirely within the Northern Hemisphere?

(*b*) What continents are entirely within the Southern Hemisphere?

(*c*) What continents are in the Eastern Hemisphere?

(*d*) What continents are in the Western Hemisphere?

(*e*) What continents are in the Old World?

(*f*) What continents are in the New World?

3. Pretend that you are out in a woods on a very dark night. You know the location of the woods but you do not know where you are in the woods. You have a compass with a radium pointer which glows in the darkness. Tell how you would use the compass to guide you home.

THE FLAT MAP OF THE ROUND WORLD

The globe is the truest of all maps, but it is costly to make one large enough for all our purposes. If we had a globe made on the scale of one inch for fifty miles it would be more than twice as high as a tall man. Flat maps are easier to make and more handy to use. Although maps printed on paper are flat, the parts of the earth which they show are really curved like the surface of a ball or of an orange. If you take a piece of orange skin and press it flat, you will either squeeze it up in the middle or tear it on the edges. In the same way, when a map is made on flat paper, parts near the north and south poles are made to look too large. When we try to show the surface of the whole round globe on a flat map, we must do one of two things. We must either stretch the parts near the poles a great deal or we must separate the map into pointed parts like the skin of an orange when we skin it by cutting the outside in straight cuts that go nearly all the way from the poles to the equator. You can see that very well by skinning an orange yourself. If you use a knife carefully, you may get the skin off in one piece. Straighten it out flat and pin it to a board. (Fig. 27-A.)

If you will examine your school globe carefully, you may be able to see how it was made. First it was a plain ball. Then the map was printed on flat paper shaped almost exactly like the orange skin in Figure 27-A. Then this paper with the map on it was glued to the round ball. If the map of the world were cut into as many small pointed pieces as is the orange skin in Figure 27-A, it would split the continents. This would not be an easy map to use. However, Professor Goode has joined some of the sharp points together to make a good world map (Fig. 178-A).

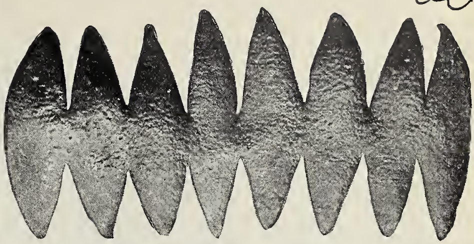


Fig. A. A whole orange skin carefully cut and spread out flat on a board. The map of the world (Fig. 179-A) was made on much the same plan.

Fig. B If the paper cover of your school globe were removed carefully, the continents would appear as on this drawing.

THINGS TO DO OR TO THINK ABOUT

1. Take an orange and use it for a globe. With pen and ink, mark on it the equator, north pole, south pole. Draw on it North and South America.
2. Cut the skin with a knife and take it off as in Figure 27-A. Cut it in such a way that North America is divided.
3. Put the skin back on the orange.
4. Find on the map (Fig. 178-A) about where you live.

Fig. A. Our steamer is leaving New York City on its way to the wet, hot country of the Amazon Basin. See the tall buildings. They form a part of the sky line of Manhattan.

A WET, HOT REGION—THE AMAZON BASIN

GOING TO THE AMAZON

When we get back home, what will you tell the family about the people whom you met on this trip? What will you tell them about all the dangers you escaped?

The Amazon River is the largest river in the world. It is so large that many ships that sail across the ocean can sail right up the river. Steamships leave New York every week for the Amazon. They sail from a pier in Brooklyn.

We put our trunk and bags in a taxicab and drive to the big warehouse that stands on the pier. Men in blue uniforms take the baggage and carry it through a long building, up the gangplank, on to the ship, and put it in our room.

The sleeping room on a ship is called a *stateroom*. The beds are commonly called *berths*. They are like those of a sleeping car because one berth is above the other. They take up less room that way.

We go out on a deck and have a good time watching people come on board the ship. Many of them have friends who have come to see them off and to bring them presents of flowers and fruit. The ship and the dock beside it are very busy places on sailing day.

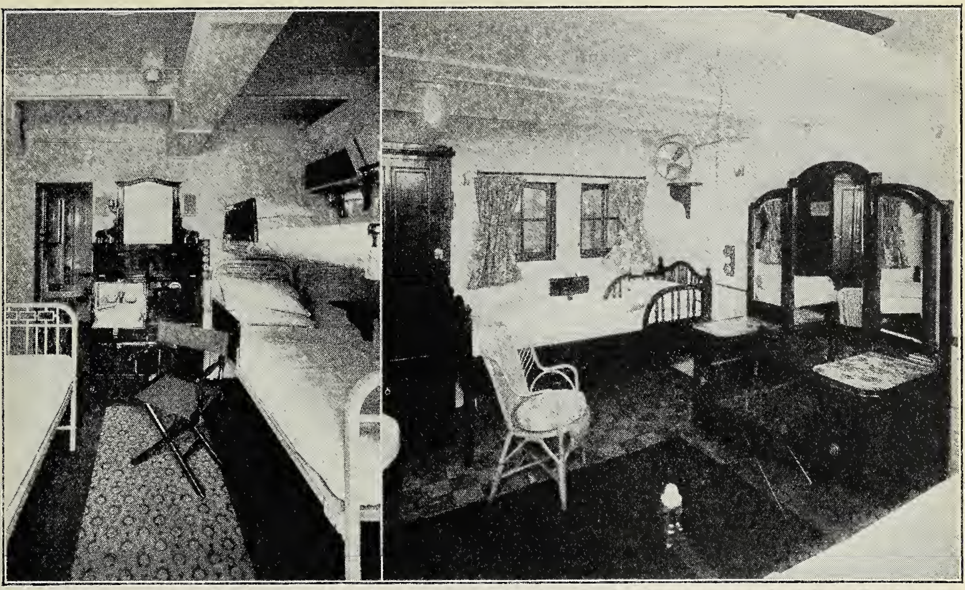


Fig. A. On our trip to the Amazon we had a stateroom like the room in the picture at the left. See how the berths are arranged one above the other. Other staterooms on the steamer are arranged very much like bedrooms at home. The picture at the right shows one of these staterooms.

Fig. B. After you have read the story, tell what this sailor is doing.

"Bong, bong, bong!" goes the gong as a man walks about the ship beating a brass gong and calling out: "All ashore that's going ashore. Ship sails in ten minutes."

The visitors go down the gangplank. The men on the wharf pull the gangplank ashore. The ship moves out into the river. It moves very slowly at first because it is being pulled by a little tugboat. As it gets away from the dock, the ship begins to quiver just a little. Its engines have started. Down the bay it goes. From the back of the ship we can see the tall buildings of New York City on Manhattan Island.

Look at the map on page 30 and tell what city we see over the left side of the ship as it sails south, and what city is on the right side of the ship as it sails south.

This body of water almost surrounded by land is called New York Bay. There are many such bays in the world, but this one is very important because people use it so much. We can count dozens of steamboats lying out on the water of the upper bay. They are anchored and waiting to load or unload their cargoes before they sail away.

There are no big waves in the bay because it takes miles of water to give room enough for the wind to make big waves. That is why small bays make good harbors. The water is always quiet, and the ship can be safe. One of the great troubles of ships is that sometimes the wind and the waves throw them against the shore. Then the waves lift the ship up and down and beat it against the shore. If the ship stays long in this position, it will be broken and pounded to pieces. Therefore the sailor's job is always to keep his ship where it will not strike anything.

Soon our ship comes close to land with buildings and trees. It is the Narrows. You can tell from the map (Fig. 30-A) what land is on each side of the Narrows.

As soon as the ship has passed through the Narrows, she begins to go up and down a little. There are some gentle waves that the sailors call a *swell*. The farther down we go the higher the waves become, and the ship rocks so that people cannot walk straight.

To the south is a little point of land. It is called Sandy Hook. Such points of land that stick out in the water are called *capes*. There are many such capes in the world. Do you think that sailors like capes?

"What is that tall, narrow little building on Sandy Hook?" someone asks. "A lighthouse," says a sailor.

Every night of the year there is a light there so that sailors can see it

Fig. A. This is a map of New York Bay, part of the city of New York, and some of the near-by towns. Tell why you think the upper bay is a good place for ships.

Fig. B. A lighthouse, the sailor's friend. Tell how the lighthouse helps the sailor. Write three sentences. Have each sentence tell something about the life of a lighthouse keeper.

Fig. A. As we left New York Bay the weather was cold. The passengers, seated on deck, tucked steamer robes about themselves to keep warm. Between meals the steward brought hot drinks and sandwiches to eat.

and keep their ships away. There are many lights around New York Harbor. The ship captain knows what the different lights mean. They tell him just where he is at any moment.

We notice that the ship is not going so fast now. Her engines have stopped. We see a little boat with two men rowing it. It comes out from a small steamer that waits near by. The men row toward our ship. Just then we see a man climb down a rope ladder on the side of our ship. The rowboat comes close, and the man steps from the rope ladder into the boat. This man is a pilot. He has been steering the steamer as she sailed out of the harbor. That is the pilot's job. Over most of the harbor the water is not deep enough for big steamships. In the harbor men have dug a long, narrow, deep place called the *channel.* The channel is deep enough to permit ships to enter. It is not very wide, and it is crooked. To enter or leave the harbor safely, the man who runs the steamers must know exactly where the channel is. Therefore men called *pilots* take charge of running ships into New York Harbor and out of New York Harbor. They know how to do this. It is their only job.

"Ding, ding!" rings a bell as our pilot steps from the rope ladder into the rowboat. The bell is the signal to the engineer to start the engines. "Grrrh, grrrh, grrrh!" goes the machinery in the ship, and we are off for the Amazon.

The days at sea are much alike. On a ship everything is done exactly according to rule. There may be trouble any time. You never can tell what the sea may do; so the sailors must always be ready.

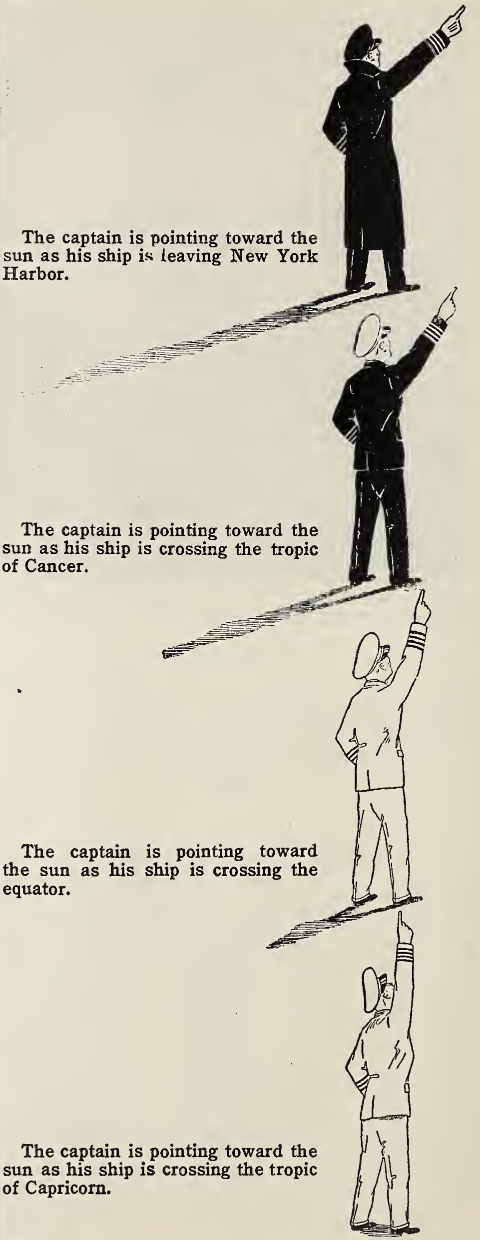
Night and day the engines run without stopping, and the little waves bump the ship as she cuts through the water. Night and day the propellers turn. Night and day they churn up the water behind the ship until the water is foaming white. Night and day the smoke rolls out of the smokestacks. Night and day a man stands up in the pilot house at the wheel steering the ship. In front of him is a compass, so that he can see in just what direction he is steering the ship.

Night and day bells ring by clockwork, and members of the crew go to work and come from their work. The meals are served exactly at the time the bell rings.

Some of the passengers sit and read. Others sit and look at the sea. Some walk round and round the ship taking exercise. Some play shuffleboard and other deck games.

On the second day we see some ships in the distance. Then for four days our ship seems to be alone on the great ocean. When someone finally sees another ship everyone runs to look, as though it were a great curiosity.

As we go south the weather gets warmer. This is indeed different from New York Bay, where the water was cold and bits of ice were



The captain is pointing toward the sun as his ship is leaving New York Harbor.

The captain is pointing toward the sun as his ship is crossing the tropic of Cancer.

The captain is pointing toward the sun as his ship is crossing the equator.

The captain is pointing toward the sun as his ship is crossing the tropic of Capricorn.

Fig. A. Pretend that these four pictures were all taken on the same day—December 21 at noon. Where is the sun overhead? Where is the shadow longest? Why?

floating in it. There we were comfortable when wearing overcoats. One morning the captain and the other officers of the ship appear in white suits. Ships' officers nearly always wear white suits in the hot parts of the world.

As the days go by, the weather gets warmer and the days get longer. When we left New York the sun rose after seven o'clock; and the thirteenth day of our voyage it rises a little after six o'clock. The days and nights are almost equal in length. That is one of the great differences in different parts of the world. In the Far North they have one season of long nights and short days. During a short day the sun does not have a chance to send much heat to the earth, and that is one reason why there is winter. Near the equator all of the days of the entire year are of nearly the same length. Therefore one month is about as warm as another. Christmas and the Fourth of July have much the same temperature at the equator.

Day by day, as we go south, our shadows on the deck of the ship at noon get shorter and shorter. At New York we had long shadows; but on the thirteenth day, when we get to the equator, we can almost stand on all of our own shadows. Your teacher can take the globe and show you why these shadows are of different lengths, and what the equator is.

The morning after we cross the

Fig. A. This map shows North America and South America and the route of our steamer from New York City to Para.

equator we see a dark line on the horizon. It is the forest near the mouth of the Amazon. That evening we reach Para.

THINGS TO DO OR TO THINK ABOUT

1. On the sand table, make a model of the land and the water near Brooklyn. On it show Manhattan Island, Long Island, the Hudson River, New York Bay, the Narrows, the Atlantic Ocean, Sandy Hook, New York, Brooklyn, Elizabeth.
2. Let us divide the class into groups and make up some more little plays for the rest of the class to guess. This time we shall play the things that we might do or that we might see other people doing on a trip from Brooklyn to the Amazon River.
3. Prove that you know what each of the following words means by using it in a sentence:

pier	**stateroom**	**berth**	**dock**
swell	**gangplank**	**cape**	**pilot**

4. Tell one reason why we have winter.
5. Look at the globe. In what direction is our ship sailing? Pretend that we are in New York City and point toward the Amazon.

Fig. A. This picture shows a part of the city of Para, Brazil.

THE AMAZON BASIN

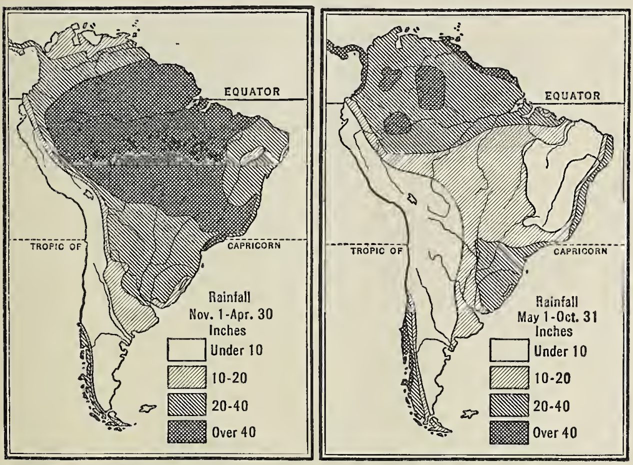
Try this experiment. Take a basin, a glass of water, and a spoon. Drop a spoonful of water just inside the edge of the basin at several places. What does the water do? Can you see now why we speak of the river valley as a river basin? The land slopes toward the center as the basin slopes toward the center; so the water runs toward the center. Now look at the map (page 37) and tell in what direction you think the Madeira River flows; the Negro River; the Tapajos River.

The basin of the Amazon River is one of the largest river basins in the world. The city of Para is one hundred miles from the ocean, and just see what a very tiny little distance it is on the map! The city of Para is on one of the several mouths of the Amazon River. I should like to show you the Amazon on a map a yard long, but that would be too big for the book. It is hard to believe that the city of Manaos is as far from Para as Chicago is from New York, and that the city of Iquitos is as far from Para as the Rocky Mountains are from New York. Now you see that the Amazon does indeed have a big basin. There is room in the forests north of the Amazon River for you to put in a row of states as big as New York, and there would still be forests all around them. Then you could do the same thing on the south side of the great river.

The Amazon Basin is a land of much rain. That is why no other river carries so much water. The water carries mud and silt and gradually drops it to make a delta. Sometimes it will rain every day for a month or two months. The people call this the rainy season. Then at another time of year there is what is called the dry season, and there may not be rain at all for two or three weeks.

It is a lucky thing for the people in the Amazon that the whole of the Amazon Basin does not have the rainy season at the same time, or it would make terrible floods. As it is, the branches on the south side of the river have their rainy season during our winter, and the branches on the north side of the river have their rainy season during our summer.

Fig. A. These two steamboats are "tied up" along the banks of the Amazon River near Manaos. The house is the home of a rubber planter. In front of the house are some beautiful palm trees.



Figs. B., C. Rainfall in South America. The way to understand this map is to think to yourself. The white parts of the map have very little rain and much sunshine. As the map gets darker the amount of rainfall increases and the amount of sunshine decreases. The figures on the maps show the amount of rain which falls from November 1 to April 30, and from May 1 to October 31. In which half of the year does the Amazon Basin receive the most rain?

Steamships go not only from the United States to Para, but some of them also go on up the Amazon to Manaos, and even to Iquitos. You can look the world over and you can never find another river where that can happen. Why is this? This Amazon Basin is the flattest river basin in all the wide world. The town of Iquitos is almost all the way across the continent, as the map shows you, and yet it is only 350 feet higher than the Atlantic Ocean at the mouth of the river. There is not a waterfall or even a place where water flows swiftly in the whole river from Para to Iquitos.

This flatness of the Amazon Valley makes quiet water in the Amazon and in many of its branches. No other river in the world has so

Fig. A. This is a relief map of South America. Find on this map the Amazon River.

Fig. A. This map is a political map. It shows the different countries of South America.

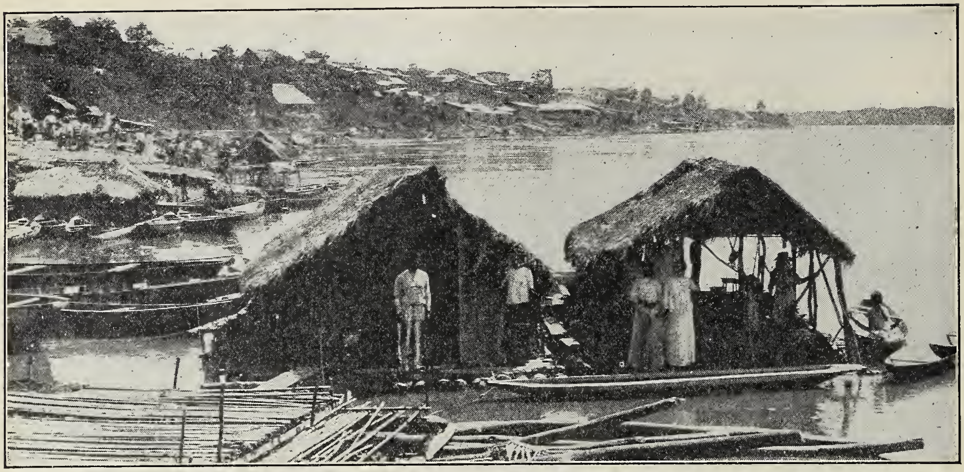


Fig. A. Along the Amazon River near Iquitos. Some of the Indians have built their houses on log rafts. The houses are tied to the shore or are floating on the broad waters of the Amazon.

many, many miles of river and branches up which steamboats can go easily. There are no railroads anywhere between Para and Iquitos nor for many miles to the north of the Amazon, nor any to the south of the Amazon. Everywhere the river is the road; no automobiles, no wagons; only boats, boats, boats. Because the Amazon is so very good for transportation, it can handle all the trade there is at the present time. This is fortunate, because vegetation is so dense and fast-growing that to cut a road through or keep it clear after it is cut through would be a very difficult and expensive task. The length of navigable waters of the Amazon Basin is greater than the distance around the world.

THINGS TO DO OR TO THINK ABOUT

1. A large stream can have a delta. So can a very tiny stream. Have you ever seen a delta after a heavy rain? Tell how it looked. Make a stream with a delta on the sand table.

2. Take the big map and find the mouth of the Amazon River. How does the map show that there is a big delta there?

3. How long do you think an automobile trip from New York to Philadelphia (a distance of about 90 miles) would take? If we could go by auto on just as good a road from the mouth of the Amazon to Para, how long would that take us? How do you know?

4. On what ocean did we travel in our trip to the Amazon? Rub your hand lightly over the part of the map and the globe that shows this ocean. Try to tell how big it seems.

5. What is the equator? Where is it? In what direction does it extend?

6. Pretend it's noontime and that we are standing on the equator. Where did we see the sun rise this morning? Point in that direction. Where is the sun now? Point to it.

7. South America is called a ....

8. New York is in a different continent. Name this continent. Name a river in each of the two continents.

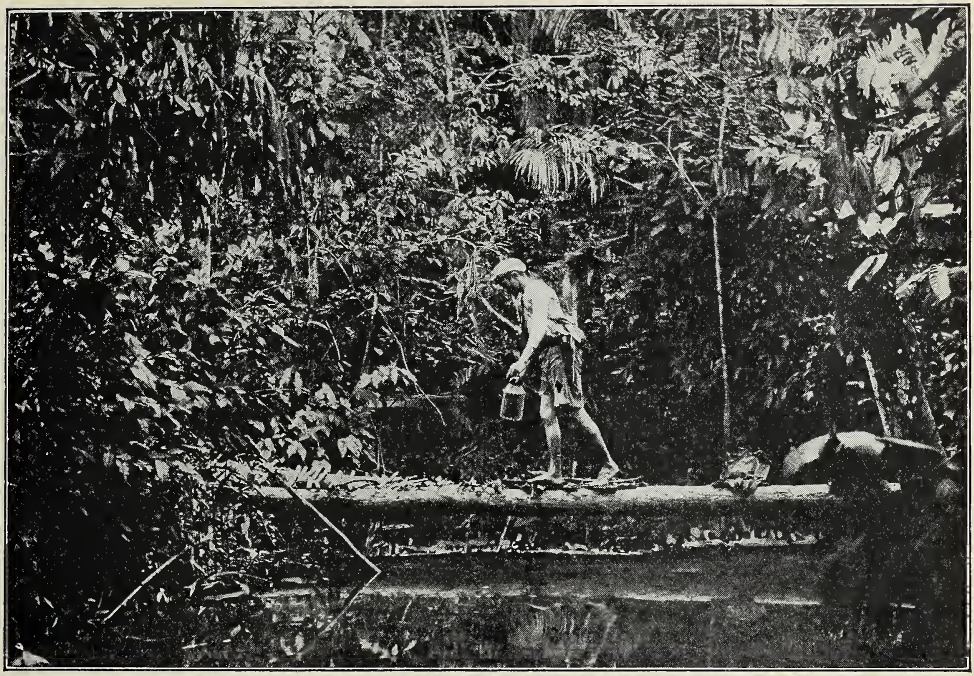


Fig. A. The thick and tangled forest of the Amazon Basin. The man is a rubber gatherer. He has filled his can with the latex of a rubber tree and is returning to the smoke shed.

THE FORESTS OF THE AMAZON BASIN

Para is a pretty city as we see it from the ship. The roofs are of red tile, and palm trees with their feathery leaves stand above the housetops.

The forest surrounds the city on all sides. The houses at the edge of the town are almost buried in the shade of the big trees. The ground is hot to our feet where there is no shade, but in the edge of the forest it is much cooler than in the sunny street.

Near the city the forest has been cut down and has grown up again. It is very thick and tangled. A man cannot get into it at all without cutting his way. Farther into the forest the trees are older and taller. There is less growth between them, but there is no grass beneath them, and the ground is covered with fallen trunks and branches.

The tops of the trees are so far away that we can scarcely see the leaves. The leaves are so thick that only here and there can we see a little patch of sky. We see vines everywhere. They have woody stems —some are as large as your finger; some are as large as your wrist; and some are as large as your arm. The vines climb around the trunks of the big trees, round and round and

round, twisting like a snake. Some hang from the trees like big loops of rope; some go zigzag from tree to tree almost like steps. There is one little climbing palm tree which will grow from tree to tree. It gets to be hundreds of feet long. Its leaves have big, crooked thorns. They are hooks like the claws of a cat. Thus the climbing palm holds to every tree it ever touches. Sometimes a leaf will hang down and with its thorns will pick off your hat or tear your clothes as you walk underneath.

The vines sometimes squeeze the trees so hard that they die. One vine is called the *murder vine.* It spreads itself out flat on a trunk of a tree as you would spread your hands. Then as you would reach around the trunk with your little fingers, this flat vine sends flat branches around the tree until they meet and there join together. The vine goes up and up, sending its little branches around the tree trunk in many places. At last it reaches the top. There it puts out its flowers in the sunshine, and in a few years its clutching arms choke to death the tree on which it grows. Soon tree and vine fall down together. This does not happen until the vine has got its head into the sunshine, has bloomed, and made seed.

In the early morning the forest is cool. Dewdrops cover the plants; insects buzz; flocks of parrots fly about talking to each other. By noon the sun has made the air in

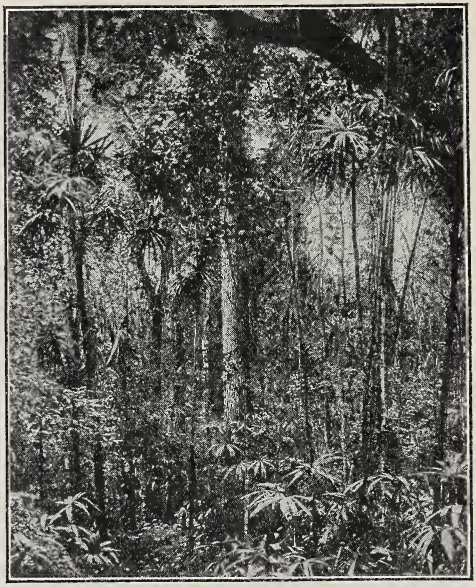


Fig. A. The large tree in the center of this bit of the Amazon forest is a mahogany tree. For what do we use mahogany?

the forest hot, stifling hot. It is like that moment before a thunderstorm in the United States. In the hottest part of the day no bird flies, no bird sings, no animal travels around, no animal makes any noise—only one little chirping locust. We pass the hut of a forest man. He is in his hammock asleep or perhaps sitting on a mat doing nothing, saying nothing. Everything sleeps in the hot part of the day.

Suddenly a great white cloud may be seen in the distance. It comes nearer. It hides the sun. The forest becomes very dark. The wind blows for a few minutes, and then rain falls. First it patters on the leaves. Then it makes a roar like a great wind as the millions of raindrops beat against the many leaves. In a

half hour the shower is over, and the sun comes out. Toward sunset it gets cooler. Then birds begin to fly about and sing. The people move about once more.

There is no winter here. The weather of the coldest months is not five degrees colder than the warmest month. All year long the sun comes straight up out of the east at about six o'clock in the morning, and the day and the night are about the same length. In some seasons there is more rain than in others, but even in the rainy season there are sunny days, and in the dry season there are days with showers. In the United States most of the trees go to sleep in the winter and start growing again when spring comes. In the tropical forest near Para many kinds of trees bloom and ripen at different times through the year. Some trees will bloom this month and other trees will bloom next month. The fruit also ripens at different times. Since blossoms and green and ripe fruit can always be found in the forest, birds and animals can always find food to eat. Our birds all build their nests and lay their eggs and rear their little ones in the spring, for that is the time of growth and food; but in the tropical forest near Para there is food at any time. Therefore one family of birds lays its eggs at one time, and, another family at another time. Man can plant a crop any time he wishes, and he can harvest a crop any week in the year if he chooses to do so.

Fig. A. The native is tapping a balata tree for its sap. The sap runs into the cup which you see in the picture, and later hardens into a kind of gum.

THINGS TO DO OR TO THINK ABOUT

1. Below are words taken from the story. Write two sentences about each word. One sentence must be true of your neighborhood. The other sentence must be true of the Amazon Basin.

forest	**seasons**	**day and**	**night**
birds	**trees**	**crops**	**vines**

2. Think awhile and then tell two very good reasons why the Amazon forest is so thick. What is another word for *thick*, when we talk about a forest?

3. Take a good look at the big map of South America. Then try to sketch a small one at your desk. Do it quickly. See how many can finish it in about five minutes. What title will you give your map? Draw in the equator and label it. Do the same with the Amazon River. Also put in Para and the ocean east of South America, and the one west of South America.

4. Do you think the people in the Amazon forests spend much time teaching their children to save things? Explain.

INSECTS AND ANIMALS OF THE AMAZON FOREST

We do not have any flies or mosquitoes during cold weather in the United States. At Para they do not have any cold weather; so they have flies and mosquitoes all the time. People in the forest often wear gloves and head nets, for there are many mosquitoes and many flies. Some of the flies make a bite that leaves a little clot of blood, and if you scratch it, it will cause blood poisoning. This is a terrible sickness. The mosquitoes carry malaria from one person to another. It is almost impossible to travel in the forests of the Amazon without getting this disease.

In the equatorial forest, where there are so many insects all the time, there are many animals and birds and even bats which eat the insects. The bats work at night and rest by day. One can often see them asleep in the top of a tall tree, hanging by their heels. They look like small packages which someone wrapped and hung there.

One of these bats is called the *vampire bat.* Most bats live on insects, but the vampire lives by sucking blood from animals. He has some queer power to bite you so that he can suck your blood and yet not hurt you at the time. If you leave your head or your toe uncovered at night, you may wake up in the morning to find a little round hole in your nose or your temple or your toe. Your bed will be bloody, for after the vampire sucks all the blood he wants it still runs from the wound. In many parts of the great Amazon forest the vampire bats are so bad that men cannot keep cows or horses because the bats will bleed them to death. The traveler in the forest must be very careful to sleep with mosquito netting covering up every part of his body, or the vampire bat may come and make a meal. In the morning the traveler may be so weak from loss of blood that he is unable to continue his journey.

The most curious insects of all are the ants. They live in ant cities. Sometimes an ant city will have as many ants as a city of people has of human beings. They will build a big pile of earth called an *ant hill,* which has many tunnels and rooms underground. They go out through the forest in long strings that march all day. Some of them like to eat wood. They are so fond of it that they may make a little hole in the foundation of your wooden house, go into the logs, eat out the inside, and the first thing you know your house will tumble down. The ants have eaten out the whole inside, and you did not know they were there. You may pick up a book from your desk and find it is only an empty shell. The ants have eaten the inside out of it. Some of these ants will pinch you; and unless you are careful, some will bite you very hard. The best thing to do when you see them is to get out of their way.

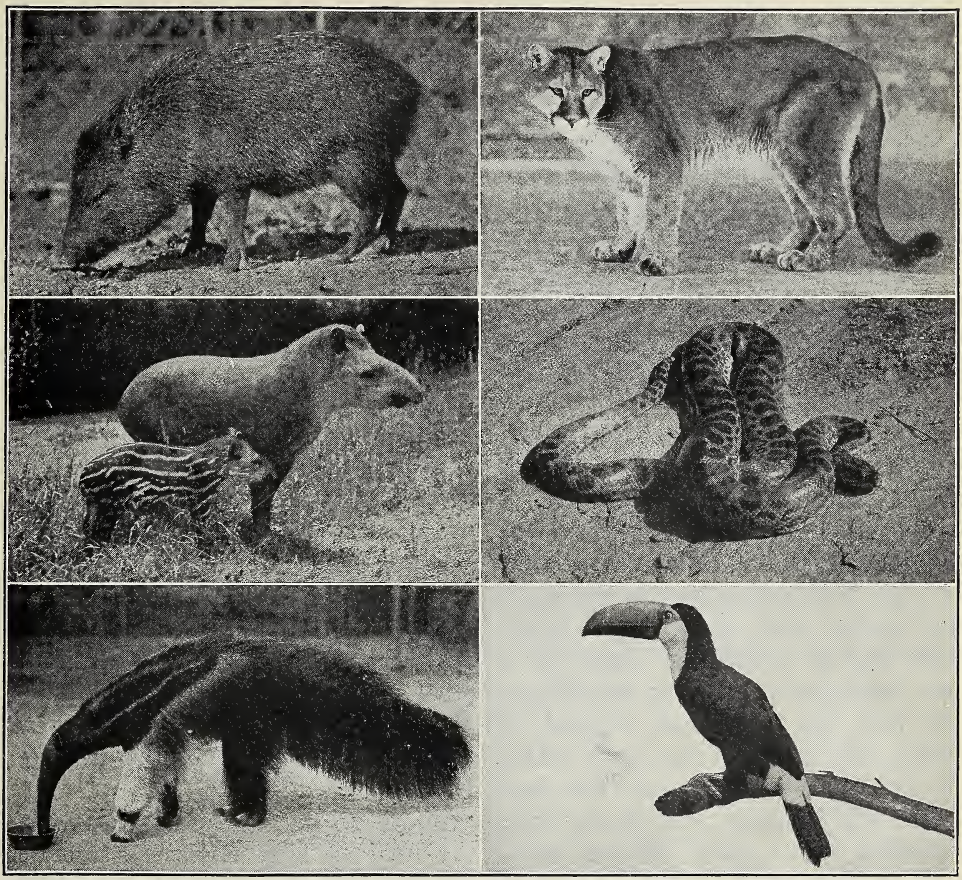


Fig. A. Below is a chart for you to copy. The chart has as many spaces as there are pictures. Here are six words: tapir, puma, anaconda, anteater, peccary, toucan. Put each word in the space corresponding to its picture. Write a sentence about each picture. The sentences should tell something about the animals and bird.

An American explorer tells this story of some ants he met in the upper Amazon:

"We met the sauba ant first in one of our night camps. We came to some ideal high ground and the quick eye of the Indian immediately knew that a human habitation was somewhere behind the trees. We got out of our boat and found a brand-new moloca, a great community house eighty feet long. The roof

had been finished, and it had a stamped mud floor and fireplaces; then it had been suddenly deserted. The only walls were thick jungle which had not yet been cleared. Not a sign of life was there. The builders had just cleaned up and gone.

"In the night I awoke, hearing a curious, faint clicking noise. I threw on the flashlight, but not a thing did I see. Nor could I quite locate the sound.

"In the morning we found out why the builders of that moloca had packed up and fled. Young America had carelessly thrown his things on the good, hard floor when he climbed into his hammock. And in the night the sauba had come. The khaki shirt was a handful of rags; in a neat, scalloped pattern as caterpillars eat leaf, the ants had clipped it away. His cord breeches were eaten, all but the buttons and the lace tips. His leggings and boots were scalloped away down to the soles. The clicking noise we had heard was the steady clip-clip of the great jaws. Don't deride. Sauba comes an inch long and has a spread of jaw of a quarter inch."

There is no grass beneath the trees in the Amazon forest; so there are very few grass-eating animals like deer. There are many fruits and nuts, and therefore there are many animals that eat that kind of food. Two of these animals are the tapir and peccary. They are somewhat like our pig. And there is the puma, an animal much like the tiger, which lies around on the branches of the trees and springs down on tapirs and peccaries to get his food. The anaconda, a snake twenty or thirty feet long, also lies and waits for these animals as they go through the forest or come to the streams to drink.

There are many small poisonous snakes. They like to lie in the sun, so that the man who knows the forest is careful never to step on a spot where the sun shines on the leaves or low undergrowth.

This tropical forest of the Amazon is one of the largest forests in the world. It reaches almost across South America from the Atlantic Ocean at the mouth of the Amazon River to the foot of the Andes Mountains near the Pacific. It also covers a great stretch of land to the north of the Amazon River and a great stretch to the south of the Amazon River.

THINGS TO DO OR TO THINK ABOUT

1. Take a large sheet of cardboard. Print at the top, *Animals of the Amazon Forest.* Then hunt for pictures of all the animals about which you have just read. Maybe you will find them in old magazines and be allowed to cut them out. If so, you may paste them on the cardboard. If you may not cut them out, draw and label them. Perhaps, when you are hunting for these pictures, you will also find some of the other animals of this region. If so, you may use them, too, if you are sure that the animals live in this forest. How can you make sure?

2. Ask your teacher or your mother to take you to a zoo, where you can see some of these animals.

3. Is it hard or easy for plants and animals to find food in this region? Why?

A WONDERFUL TREE

Many trees along the Amazon bear fruits and nuts. One of these trees is the Brazil-nut tree. Everyone knows the long Brazil nut that is shaped like the section of an orange and covered with a rough black shell. The tree that bears these nuts sometimes has a trunk six feet in diameter, and it may be as much as seventy-five feet before the first limb is reached. It is the highest tree in the forest and stands towering above the rest. Its fruit has a thick, hard, black shell containing fifteen to thirty nuts. As the fruit weighs from two to four pounds, you can easily guess what would happen if it hit you on the head as it fell from the tree, and you can also guess why the natives will not travel through the forest during the season of the ripening of the Brazil nuts. If they must go under a nut tree, they pause and listen. If the fruit is falling, it will be striking the leaves; and they can hear it say "clip, clip, clip" as it strikes the leaves of the trees beneath its tall mother.

These nuts do not open when they fall. The shell is so hard that the animals cannot eat them; therefore man can get them. He breaks the hard outer shell with an ax. Thousands of sacks of the nuts are shipped from Para to our country. We might get more nuts than we do, for whole shiploads of them go to waste with no one to pick them up. There are not many people in the Amazon forest. Perhaps you can tell some reasons why this is so.

Fig. A. The shell in which a dozen or more Brazil nuts grow. This is one of the many free foods produced by nature and mostly wasted in the tropic forest.

THINGS TO DO OR TO THINK ABOUT

1. The tree that gives us chocolate also grows along the Amazon. Did you ever eat a Brazil nut with a covering of chocolate on it? Do you think we might say that the Amazon forest is a candy forest?

2. On a map of North America, point to a very dry region. Why do we find so few people living there? Now point to the Amazon Basin. Why do so few people live there?

3. Below are three sentences. One of them is a true statement. Select the sentence which makes a true statement.

   People can live best in a very dry region.
   People can live best in a very wet region.
   People can live best in an in-between region (not too wet and not too dry).

   Prove that you are correct by naming and pointing on the map to a region where you think this to be the case.

4. Would your shadow at noon be longer in New York or in Para? Why?

5. Pretend that one of the Brazil nuts, shown in Figure 45-A, had told you the story of its life. Write the story.

Fig. A. The man who took this picture was standing on the shore of the Amazon River at the city of Manaos. He pointed his camera toward the wide Amazon. See the long pier. At the end of the pier is a wharf. It is a floating wharf. Some of the ships are tied up at the wharf. See the railroad tracks on the pier running out to the floating wharf. Why are the tracks laid out to the wharf?

UP THE AMAZON TO MANAOS

The boat on which we came from New York goes on up the river past Para, but we stay there a few days and go upstream on a Brazilian steamboat. At Para the river is twenty miles wide, but the boat soon enters the narrow channels that wind in and out between hundreds and thousands of little islands. These islands are made of sand and mud brought down by the Amazon. Many of these channels are so very narrow and deep that the steamboat can go so close to the shore that the branches of trees sometimes touch its sides. Figures 39-A and 48-A give a very good idea indeed of the hot, wet forests of the Amazon and Congo basins.

After a day of this, we come out upon the Amazon itself. Its banks are grassy for a short distance, because the floods of the rainy season rise so high that they wash away the trees that stand upon the bank. Hundreds of fallen trees are floating down the stream. Some have collected on sandbars in the river. Sometimes they pile up by the sandbars until they make a wooden island which floats off down the river with the flood.

The Amazon has a season of high water and a season of low water. At the season of high water the land is flooded. The houses stand on stilts or poles so that they can be out of the water in the season of overflow.

At the season of low water many sandbars can be seen on the river, and they change from time to time. A boat may strike a sandbar this year in the place where there was deep water last year. The pilots who guide the steamers have learned to watch carefully for any change in the river course. By noticing the way the currents seem to run they can usually tell where the water is deep.

Our boat is full of people. It is crowded. Nearly all are Brazilians from a state farther south called Ceara. Ceara is not in the forest country. Often there are great droughts in Ceara, and the people have no crops. Then the Ceara people come to the Amazon country to work in the rubber business which is carried on in the dry season. Here they are on our boat going from Ceara to the rubber forest. Whole families are crowded together so thickly you wonder how they can stand it. Their hammocks hang one above the other, three or four high. Yet they are good-natured and pleasant and polite. They spend much time playing guitars and singing.

The water of the Amazon is yellow, always yellow, and after we have been going up the river for five days, we suddenly see that the water on one side is black. This is the water from a branch called the Rio Negro. (*Negro* is Spanish for "black.") Near the mouth of the Rio Negro is the city of Manaos.

Manaos might be called a rubber town. The business men of Manaos are always talking about rubber, rubber, rubber. They are very much interested in the price of rubber. If the price of rubber is high, the people have plenty of money because rubber is the chief thing they have to sell. It is a great rubber market. The city is more than half as large as Salt Lake City. It has a fine trolley line. The cars were made in the United States at St. Louis. The pieces to make a car were packed in boxes and brought down here on steamships. Everyone who can afford it rides on the trolley cars in the evening in Manaos. In that very hot and muggy town one is cooler when riding.

THINGS TO DO OR TO THINK ABOUT

1. Take the map of South America that you made several days ago. Add Manaos to it. How long is the trip from Para to Manaos? Show this also on your map.
2. What do we mean when we say that we are going "up" a river? What do we mean when we say that we are going "down" a river? When we go from Para to Manaos, do we travel up or down the Amazon? If we go back from Manaos to Para, will we travel up or down the Amazon? Why?
3. We call the Madeira River a branch or a tributary of the Amazon. In what direction does it flow? Find other large tributaries of the Amazon. Name them and tell in what direction each flows. Then add all of them to the map which you are making.
4. Make a list of the things you might do for pleasure at Manaos. Do the same for your own neighborhood. Make a winter list and a summer list.
5. If you were going to send some Christmas presents to a rubber gatherer, what would you send to him? What things from his country would you like him to send to you?

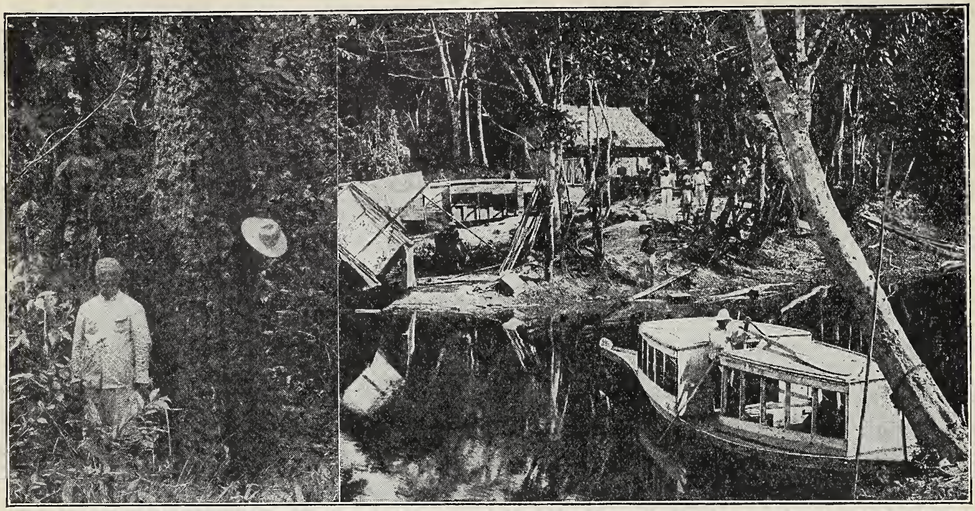


Fig. A. At the left is Mr. Diaz standing beside one of his rubber trees in the Amazon forest. At the right is the boat in which he carried the rubber gatherers to his rubber lands. He will use the boat also to float the rubber from his lands to the large steamers on the Amazon.

THE RUBBER WORKERS

Fifty of the people from Ceara who came up the river on the boat with us are met by a man named Diaz, who owns some rubber lands far back in the interior. He has paid the way of the rubber workers from Ceara. He takes them to a store and buys the things they need for the rubber gathering and the clothes that they must have. Then Diaz takes the people on a smaller steamboat. They sail up the river, but soon turn off to a smaller river, a branch of the Amazon. The boat creeps along past trunks and branches of trees that have fallen into the stream. At last the boat can go no farther. Here many canoes are waiting. The people get into the canoes with all their things and paddle on up the small river. For two days they are winding in and out among the fallen logs and branches of trees, with an alligator now and then slipping into the water as they come along.

When they get to Mr. Diaz's rubber lands, everything is ready. A great deal of very hard work has been done in cutting a path through the forest all the way around Mr. Diaz's rubber land. From this main path are many side paths called *estradas*, which means in Portuguese "roads," or "walks." Each estrada winds through the woods from rubber tree to rubber tree. There are from seventy to one hundred and twenty trees on each estrada.

There are twenty men in the party altogether. Each man is given two or three estradas to take care of. Some of the men have wives and

children with them. Each man builds a hut at the place where his estrada comes into the main path. It does not take long for them to build a hut. A few poles are set up, some palm leaves are spread over the top for a roof, a hammock is hung inside. The cheap wooden box that serves as a trunk on the long journey now serves as a chair. Three or four little poles make a table, and that is the home during the rubber season.

A cotton shirt, a pair of overalls, and a straw hat are all the clothes the rubber gatherer usually has. The rubber gatherer gets up in the morning before daylight; and while it is still cool, he fastens a little lantern to his head, as the miners do, takes his ax and a long knife, and goes to visit the rubber trees in his estrada. He cuts a gash in the bark of each tree and fastens a little cup at the lower end of the gash. The latex, or juice of the tree, runs out of the cut place in the bark and into the cup. From it rubber is made. By six o'clock he has made his round, gashing each of the trees and putting on the cups. He is now ready for breakfast. As soon as this is over, he starts out again with two buckets. Again he visits every tree. This time he pours the latex or white juice of the trees into the bucket. He carefully turns each cup upside down over a stick so that it may drain dry and so that no water may get into it.

The rubber gatherer gets back to

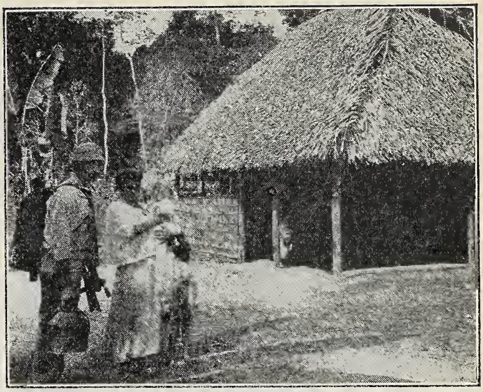


Fig. A. One of Mr. Diaz's rubber gatherers with his family standing outside their forest home. The man has in his left hand a kind of hatchet for cutting the bark and in his right hand a can to hold the latex.

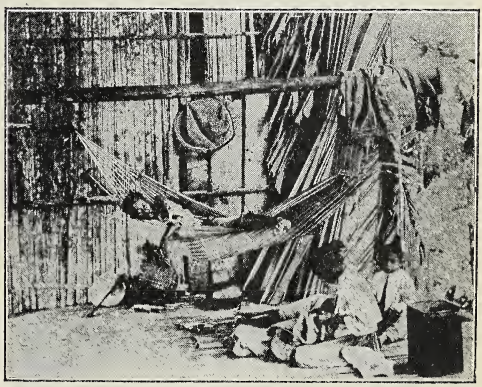


Fig. B. Another of Mr. Diaz's rubber gatherers with his family inside their hut.

Fig. C. Mr. Diaz's workers loading balls of rubber on to the Amazon steamer.

Fig. A. Tapping a rubber tree.

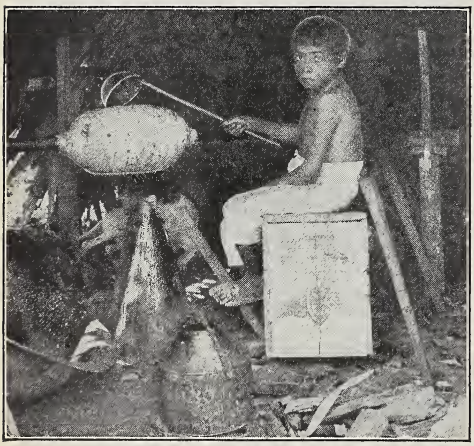


Fig. B. Smoking the rubber.

Fig. C. Down the river to market. See the ball of rubber and the bag of rubber scrap in the boat.

camp with one or two buckets of latex. Now he must spend most of the rest of the day curing it and making rubber. He builds a fire and on this puts palm nuts, which make a very bitter smoke. A metal funnel is placed over the fire. The small end of the funnel is a little chimney, and the smoke goes out through it. Into this smoke the rubber gatherer sticks a wooden paddle that he has dipped into the bucket of latex. It looks like a big spoon covered with milk. The moment the smoke hits the latex, it hardens and turns yellow. Again he dips the paddle into the latex, and again he puts it into the smoke—into the latex, and into the smoke, back and forth, back and forth for hours, until at last the two buckets of latex have become a big ball of rubber.

The second day he taps the trees in his second path, and the third day he taps those on the third path.

If the rubber trees are good, our rubber gatherer may get twenty or twenty-five pounds of rubber in a day. Rubber gatherers usually work from 130 to 150 days. On the average a ton per man is a good season's work. He is paid so much a pound, but before he gets any money for himself, he has to pay back the money that was used for his steamship ticket from Ceara, the things he bought in Manaos, and the food he may have eaten while he was working in the forest. It is not a very good business, but some rubber gatherers make money.

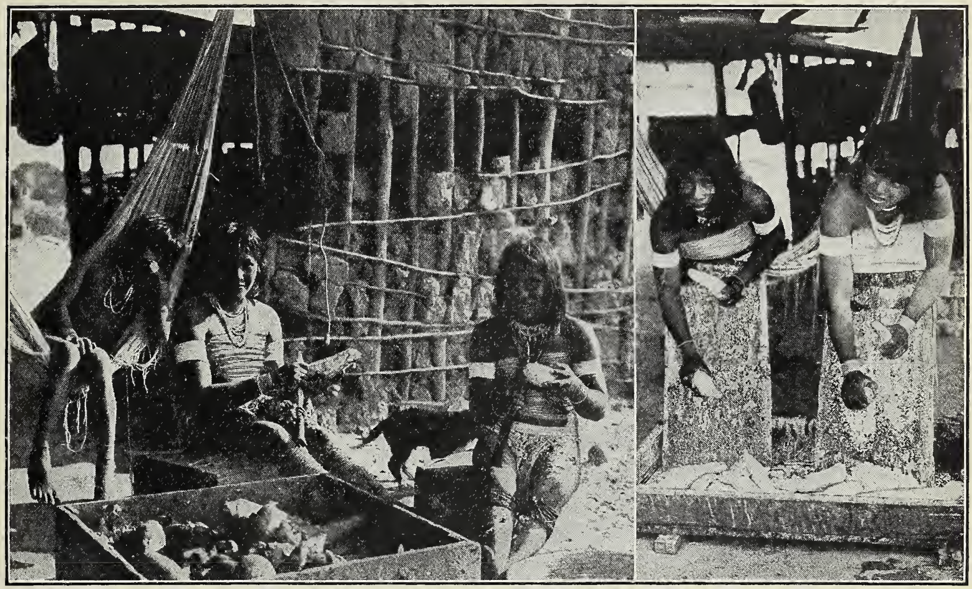


Fig. A. In the picture at the left the native women are scraping cassava roots. In the picture at the right they are grating cassava.

CASSAVA, THE FOREST FOOD

The chief food of the rubber worker is called *farinha*. This is a kind of meal or flour made from the root of a plant called *cassava*. The plant has big, long roots that look very much like large sweet potatoes. These roots contain a kind of poison that is destroyed by heat. That is lucky for man, for in many parts of the Amazon country cassava roots are about the only thing good for man to eat which the ants will not eat first. There are places in the Amazon country where the ants will not let man grow a sweet potato or a corn plant or a sugar cane stalk because they eat it themselves. Since the poison kills the ants, they let the cassava alone. Men can dig the roots, cook them a little, and let the heat drive out the poison. Then the roots are grated and dried. This makes a coarse meal which will keep for years. It is the chief food of all the Amazon people—whether it is the rubber gatherer making balls of rubber to ship to New York or whether it is an Indian far back in the forest who never saw a white man. When the price of rubber is too low and the rubber workers have not enough money to buy food, they grow more cassava to keep themselves from hunger.

THINGS TO DO OR TO THINK ABOUT

1. Give two reasons why the rubber gatherers in the Amazon have to wear so little clothing.

2. How does it happen that they like to

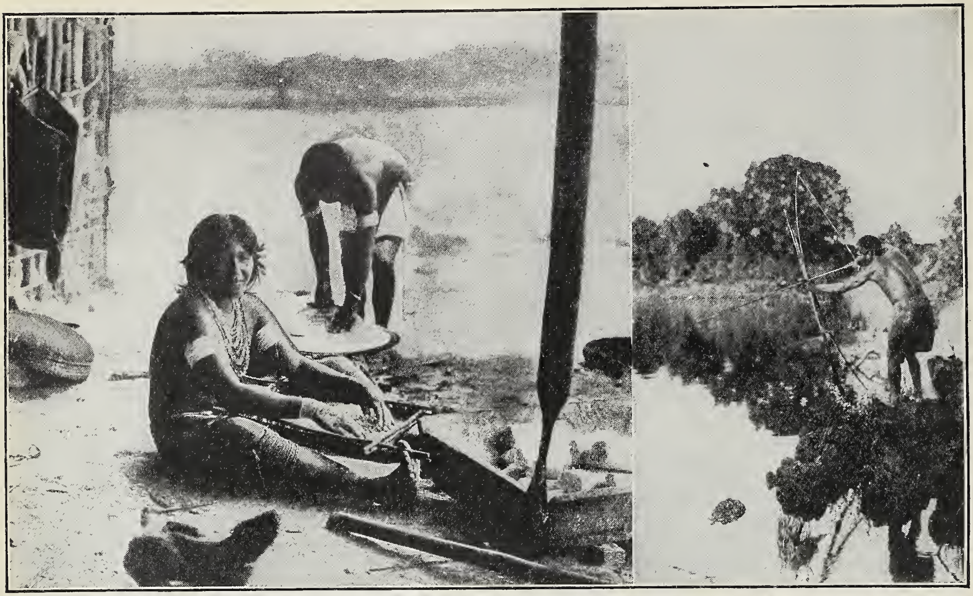


Fig. A. At the left native women in the Amazon Basin are sifting the cassava meal. At the right an Indian is shooting fish with bow and arrow.

build their homes with poles and palm branches instead of sawed boards?

3. What shape are the roofs of their huts? Why?

4. Why are the huts often built on stilts?

5. Ask your teacher for a large desk map that shows the outlines of all the continents in the world. Find North America and neatly label it *N. A.* Find South America and label it *S. A.* Put a dot exactly where New York is located and very neatly label it *New York.* In the same way, locate San Francisco, Para, Iquitos, Chicago, Philadelphia. Then draw a line connecting New York, Philadelphia, Chicago, San Francisco. On the line, put an arrow which points toward the west. What will this show? Then draw a line from New York to Para and place an arrow to show in what direction we traveled. Then draw in the Amazon River, touching Para, Manaos, and Iquitos. Again use the arrow to show how we traveled. Call this map *Trips That We Are Taking.* Put it away. We shall need it very often.

6. What kind of food do the people in the Amazon Basin send us? How do they help us to make our automobile trips more pleasant?

7. Rewrite the following. Omit the incorrect statements:

In the Amazon Basin there is so much rain and heat that it is very (hard) (easy) for a man to grow a crop. This means that he (does not have to) (has to) work very hard to give his family enough to eat. So he gets very (lazy) (industrious). He (often) (hardly ever) has to ask a neighbor to help him. He (almost never) (many times) has to help his neighbor. He (has to) (does not even have to) think seriously to find out the best way to plant and harvest his crop. Nature does (nothing) (much) for him. In the Amazon Basin, a man (has to) (never has to) save, because in the Amazon Basin it is (summer all the year) (summer part of the year and winter the rest of the year).

8. Make a chart of pictures and drawings of *Things We Use That Are Made of Rubber.*

Fig. A. This is a picture of Battle Harbor, Labrador. Our ship anchored here to escape the storm. If you look on page 218, you will see a map picture of the country called Labrador.

THE FAR NORTH AND THE FAR SOUTH

FROM NEW YORK TO ESKIMO LAND

Pretend that you are an Eskimo boy or a child of an Amazon rubber worker. If you had your choice, which would you rather be? Which can have more fun and find more interesting things to do?

At Para we found that the day and the night were about the same length all of the year. We know that during the winter season in our own country the day is short and the night is long. As we go farther north, the winter days get shorter and shorter and the winter nights get longer and longer. If we keep on going north, we come at last to a place where the winter is so long and cold and the summer is so short that there are not enough summer days for our farm crops to grow. Therefore people cannot plant crops and have farms in the Far North.

How could people live if they had no trees, no wood, no wheat, no corn, no milk, no sugar? The Eskimos know how to do it. Let us find out about this kind of life. Let us go to Eskimo Land far away in the northern part of North America. It is a long way from our own country.

We sail out of New York Harbor again. This time when we pass Sandy Hook we sail north, not south. We have to sail in a ship of our own, for no ships go regularly from New York to the Far North as they do to the Amazon. Let us sail in June. In four days we shall see some high, rocky land. It is the

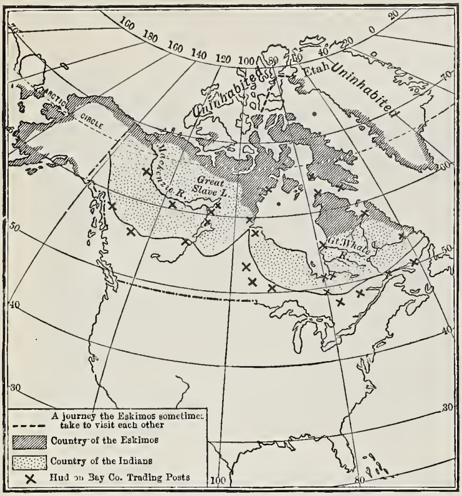


Fig. A. On our trip to the Far North we shall visit Eskimo Land and the Great North Woods where the Indians live. This map shows us Eskimo Land and the country of the Indians.

Fig. B. This is a picture of one part of a globe such as you have in your classroom. You see other pictures of this same globe in Figure 16-A. Trace our journey Eskimo Land.

island of Newfoundland. Soon we see something white in the distance —high and white. It is an iceberg; it shines in the sun like snow. We are now in a sea where icebergs come floating down from the North every summer. They come from Eskimo Land.

The captain of our ship fears a storm; so he takes the ship into a harbor on the coast of a country called Labrador. We never saw a coast like this one. There is not a tree to be seen. This is because of the cold sea. The water in the sea is always ice cold, and the winds from the ice-cold water make the air cold. Trees cannot grow in such cold places. We see only high, bare hills and a coast with many rocks. This harbor does not seem much like New York Harbor. Here are only a few little frame houses and a church. Fishermen live in the houses.

After waiting two days for the storm to pass, our captain sails our ship out of the harbor. On to the north we go. Our ship often comes near floating ice. Often we see icebergs in the distance at the place where the sea and sky meet. We call this place the *horizon.* Have you ever looked at the horizon from your school or from your home? Tell what you saw. Every day of our journey the sun rises earlier than it rose yesterday, but it does not rise very high in the sky. Our shadows on the deck of the ship are longer and longer. Your teacher will explain this by using the globe.

One week after we leave the Labrador harbor we cross the arctic circle. This is the place where the day is so long in June that the sun

Fig. A. This village is in Labrador. It is wintertime. The weather is very cold. Snow covers the ground. One of the villagers has a fine team of Eskimo dogs hitched to his sled.

does not set at all. We land on the coast of Greenland.

THINGS TO DO OR TO THINK ABOUT

1. Look at the globe and tell in what way the equator is like the arctic circle. How is it different? See if you can find how many miles the one is from the other.

2. As we sail from New York to Greenland in June, are the days getting longer or shorter?

3. Draw a picture of Eskimo Land. Show in the picture: some land, the sky, the horizon, and the sun.

4. Take a good look at the part of the globe between New York and Greenland. Then make a big sketch map, on the floor, of this part of the world. On it show New York, Sandy Hook, Newfoundland, Labrador, Greenland, the name of the ocean on which we sailed in our trip to Greenland, the arctic circle. Write the words "north," "south," "east," "west," in the correct places on the floor map. Then draw an arrow to show the direction of this trip. Also draw an iceberg in its correct location. How will anyone who looks at the map know what the arrow and the drawing of the iceberg mean? To make sure that everyone does know, make a tiny drawing of the iceberg in the left-hand lower corner of the map and write beside it, "This means an iceberg." Do the same with the arrow.

5. Point to Greenland on the globe. Why do we call Greenland an island? Make an island on the sand table. Point to an island near New York and name it. Name and point to another island that we passed on this trip.

6. Let us turn to the back of our notebooks. At the top of one page write: *Continents That We Can Locate.* Underneath, write the names of the two continents that we know. At the top of the next page, write: *Rivers That We Can Locate.* Underneath, write the names of the four rivers in South America that we know. Do the same with the *Oceans That We Can Locate;* the *Cities That We Can Locate;* the *Islands That We Can Locate,* and the *Mountains That We Can Locate.* Now go over all these lists again and point to each place on the map or the globe. Keep these lists carefully. We shall often add new names.

7. On Figure 54-A point to Eskimo Land; to the land of the Indians.

Fig. A. As our ship sailed along the Labrador coast toward Greenland, we began to see large pieces of floating ice. Sometimes our ship had to push aside chunks as long as itself.

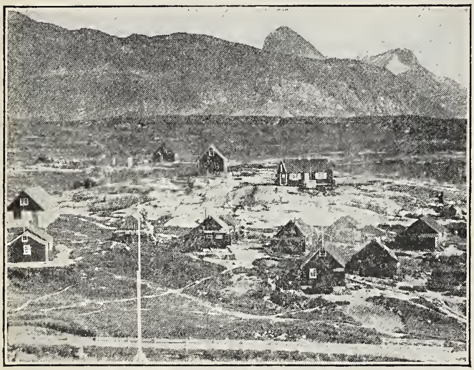


Fig. B. Greenland has a few small villages along the coast. The picture shows the village of Godthaab as it appears during the short, cool summer.

THE GREENLAND ESKIMOS

The globe shows that Greenland is a very large land. It is many times as large as the whole of New York State, yet it has not one farm, one field of wheat, or one cow. Greenland is one of the lands where the Eskimos live, but there are only 14,000 Eskimos in all Greenland. We find that many people living on one street in some of our larger cities, and there are many towns in the United States that have more than 14,000 people.

Some of these Greenland Eskimos live hundreds of miles north of the arctic circle. They live at a place called Etah, where the winter night is dark for a month and where in summer the sun shines for a month.

Do you think there are any other people in the world who love the moon so much? Moonlight in the arctic night is very beautiful. When the moon does not shine, the stars are very bright.

How do people live in such a cold land? The Greenland Eskimos live from the sea. The cold land does not produce much, but, strange to say, the cold sea is full of life. It contains many little animals called

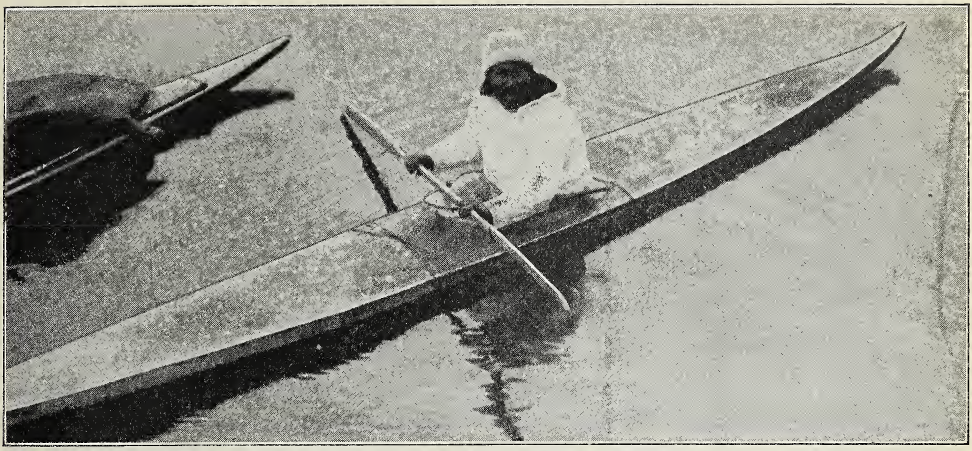


Fig. A. The Eskimos go hunting for walruses in a wonderful little boat called a *kayak*.

shrimps. A shrimp is about as big as a man's thumb. Perhaps you can get a can of shrimps at the store and see what they look like. Shrimps eat still smaller animals, and these little ones in turn eat very small plants, so small that you could scarcely see them at all.

The shrimp is the chief food of the seal, and the seal is the chief food of the Eskimo. The Eskimos also eat the flesh of small whales, called *narwhals*, and walrus meat. The walrus is a very big kind of seal. The walrus has one job. He must catch clams. He dives down to the bottom of the sea where it is shallow. There he eats clams for eight or nine minutes, and then he comes up to the top of the water to breathe. The Eskimo's chance comes when a walrus swims up to breathe.

The Eskimos go hunting for walruses in a wonderful little boat called a *kayak*. Besides the kayak, or hunting boat, the Eskimos make a bigger boat to be used for traveling. It is called an *umiak* and will hold several people. It is sometimes called the women's boat. The kayak is twenty-one inches wide, nine inches deep, a very wonderful boat. Sometimes it is built with a framework of ribs of whale tied together. This frame is covered with sealskins sewed together so that they are perfectly water-tight. The sealskin covers the entire top of the boat except the hole where the man sits. The man wears a coat made of sealskin. When sitting in the hole of the sealskin cover, he puts the bottom of his coat over the hole and ties it fast. This keeps water from getting into the boat. Also his coat is tied securely at the wrists and neck. The boat with the man in it might turn over in the water and come up without ever having taken water into the boat or into the man's clothes.

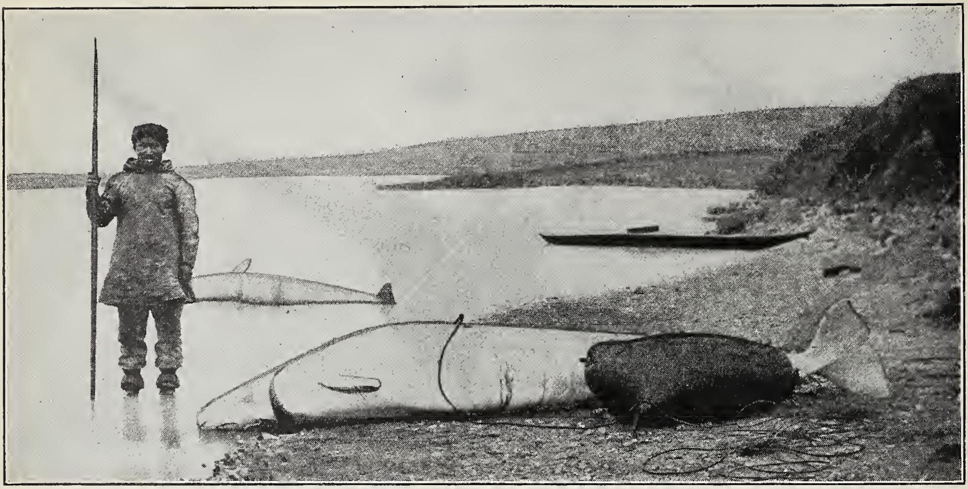


Fig. A. This Eskimo has caught two narwhals, a kind of small whale. See the long rawhide rope, the sealskin full of air, the kayak, and Eskimo spear.

The walrus hunter gets into the kayak and paddles out toward the place where he sees a walrus catching clams. He sees the walrus go down. He knows that Mr. Walrus will be up in about eight minutes. The hunter paddles quietly close to that place. The walrus comes up. The Eskimo throws a harpoon so that it sticks in the neck of the walrus. Fastened to the harpoon is a long rawhide rope made of sealskin. On the end of the rope is a sealskin blown up tight and full of air like the bag of a football or a basket ball. As soon as the harpoon sticks the walrus, he dives and swims under the water; but the sealskin full of air floats. It shows where the walrus is. Many kayaks follow him, and finally, when he has been tired out, the men kill him with a spear.

A walrus weighs about as much as a bunch of twenty boys from the sixth grade would weigh. When the men kill a walrus they take him to the shore, cut him up, and the whole village has a fine feast. After the feast they have hundreds of pounds of meat to be put away for the winter. This they do by digging a hole in the frozen ground. They put the walrus meat in the frozen ground, put some ice on it, and pile stones over it. In this way the Eskimo hides his precious meat and keeps it safe.

Sometime the next winter, when it has been dark for a month, an Eskimo with a sled drawn by dogs may come along the shore by starlight. He will look around carefully to find the *cache*—the place where he stored the walrus meat. His father and grandfather stored their meat in this same place, and there

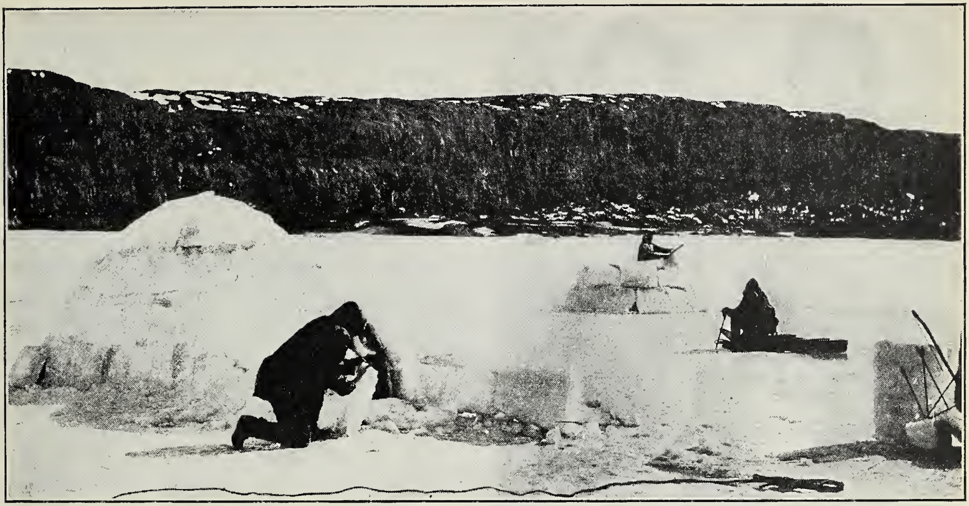


Fig. A. Sometimes the igloo is built entirely of hard blocks of snow as in this picture. One Eskimo is building a snow tunnel. The other Eskimo is shaping and putting into place the blocks of snow for his igloo.

are many other caches here. He finds his own and rolls away the stones. Underneath is the walrus, all the pieces frozen fast into one hard mass of meat. The Eskimo takes a long, narrow stone which he uses as a wedge, and he pounds with another stone. He pounds and pounds and pounds. The Eskimo has plenty of time, and he is a very patient man. No factory whistle will call him, and he is not going to take a train; so he pounds and pounds. One by one he gets the pieces of frozen meat loose from the mass. At last after much work every piece of walrus meat is stacked up on his sled. He cracks his whip and away go the dogs and sled over the snow. They go toward a place where the man sees a little light. It is the light from the oil lamp shining through the sealskin window of his hut. Sealskin, when it is used instead of glass, lets light through, very much as paper or as ground glass does. The children shout with joy when father comes home with the walrus meat. He takes a knife and hacks off pieces and tosses the frozen meat to the children, who are sitting on a wide bench or bed made of whale ribs or driftwood and covered with skins of the walrus and seal. The children chew the raw, frozen meat as the children in our country would chew candy. The Eskimos love their children very dearly. Meanwhile mother fills the pot and invites the neighbors to a fine meal of boiled walrus. The dogs get a share, too, for the dogs are a very important part of Eskimo life. The Eskimo has no other domestic animal. When he goes traveling over the land, the

Fig. A. Two Eskimo girls who live in Greenland. See the beaded collar which one of the girls is wearing. The trousers and boots are made of sealskin. The white stripes on the trousers are pieces of fur from reindeer breasts.

dogs pull his sled; and when there is seal or walrus to bring home, they pull his sled.

The winter house of the Greenland Eskimo is called an *igloo.* It is usually made of stones chinked with earth and roofed with pieces of sod. Snow piled up around it keeps the wind away. The people often enter it through a long snow tunnel which is so low that they must crawl on hands and knees. This long, low tunnel keeps cold air from getting in.

The house is very small, and sometimes when several lamps are burning at one time, the little, low room gets so warm that the people take off most of their clothes.

These people are able to live in this strange place because long ago someone invented a wonderful lamp. This lamp is a stone dish with a wick of dried moss in it. The lamp is filled with the oil made from the melted fat of seals and walruses. The flame from this oily wick is about two inches long. It lights the dark little homes on dark winter nights. Above the lamp hangs the cooking pot, and above that is a framework on which the family puts the boots and clothes to dry.

To keep the family warm, the women and girls must do a great deal of work. They must make the skins of the seals into trousers and coats. They must make boots, caps, mittens, sleeping bags, and blankets. For threads they use the sinews of the back of the narwhal (small whale). There is no thread in the world so good for sewing skins and hide.

In summer the Eskimos save some grass. In winter they put a thick layer of the dried grass inside their boots; it keeps the feet warm.

The girls make a collar of beads. Often it is as wide as a little cape. No two collars in the village are alike. The girls are very proud of their handsome collars.

The Eskimos live almost entirely on the meat of the seal, walrus, and whale. They eat much fat meat. This fat is called blubber. It is very important to the Eskimos. It helps to keep them warm. Blubber is a layer of fat under the skin of the

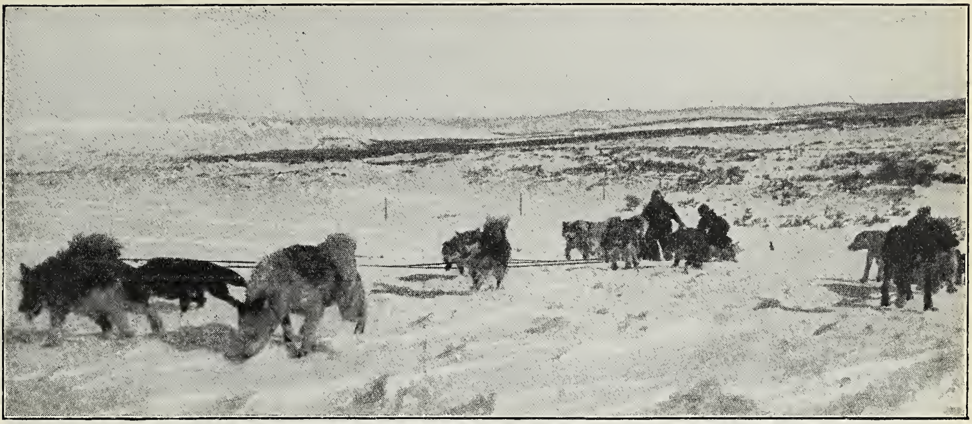


Fig. A. The explorers on their way to the Eskimo village. Read page 62.

whale, seal, or walrus. Blubber is a kind of blanket that keeps these animals warm even in the ice water in which they live.

The Eskimo hunter has three jobs —to get enough of seal, walrus, and whale to feed his family, to feed his dogs, and to feed his lamp. The lamp burns the fat of melted blubber, and sometimes the people will go hungry so that they may have enough to keep the lamp going. Without the lamp there is no light and warmth in the long winter night that lasts for days and for weeks. It is not pleasant to be in a little house all day with no fire, no sun, no lamp, and the thermometer forty or fifty degrees below zero outside. The Eskimos in their warm clothing like best to be out of doors.

THINGS TO DO OR TO THINK ABOUT

1. Make a chart called *Animals of the Arctic*. Label each picture.
2. Make another chart called *Tools That the Eskimos Use*.
3. Make up a game about the Eskimos.
4. Show by a drawing some ways in which the Eskimos help one another. What makes these people want to help one another?
5. Did the Amazon rubber workers help one another or did each one work alone? Why was this true?
6. In these sentences, fill the blank spaces with words that will make sense:

In the Amazon forest, the people .... save in the summer for the winter because ....

In Eskimo Land the people .... save in the summer for the winter because ....

7. Rewrite the following. Omit the incorrect statements.

In the Amazon Basin the people (have to) (do not have to) work hard to get enough to eat. But in Eskimo Land they (do) (do not) have to work hard. In the Amazon Basin the people (cannot) (can) find food without thinking very much about it. And in Eskimo Land they (cannot do this at all) (can also do this).

8. Why do Eskimos use sealskin instead of glass for their windows?
9. Point to Eskimo Land.
10. Make two drawings to show the difference between New York Harbor and the harbor where we stopped in Labrador.

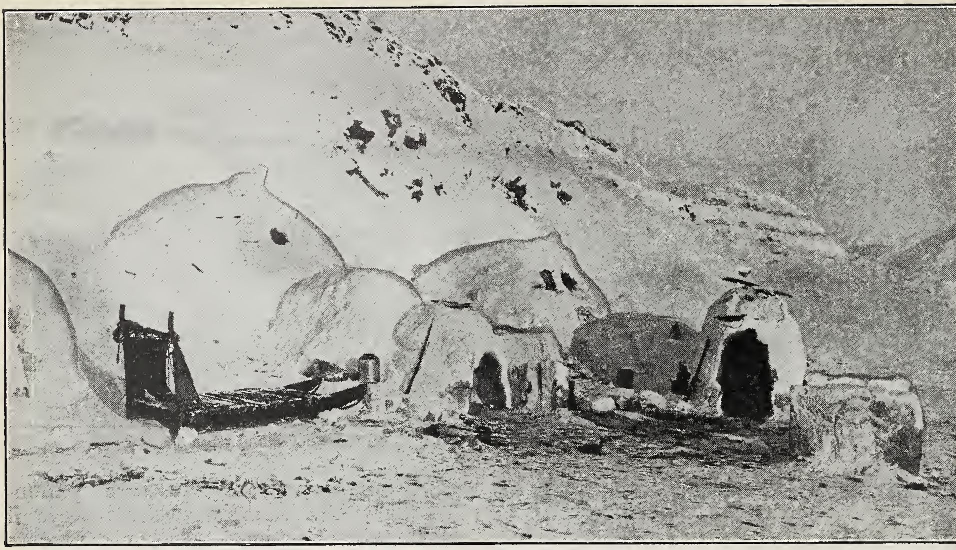


Fig. A. On his way to the Eskimo village, Mr. MacMillan built the igloos which you see in this picture.

A NIGHT IN AN ESKIMO VILLAGE

An American explorer, Mr. MacMillan, has spent much time with the Eskimos. He tells a story of how he and his party with their dogs and sleds came one night to an Eskimo village. Before he reached the village, the children had seen him and had waked the others to tell them the great news. A white man was coming! The people of the village stood in the doors of their houses and were glad to see Mr. MacMillan, but no one asked him to come in. Why was this? Mr. MacMillan had been in this village before, and the people were his friends. Why did no one ask him to come in out of the cold? Eskimos feel greatly honored when a traveler stops with them. Therefore no one invited Mr. MacMillan to come in because it would be rude for one family in the village to ask for this great honor. Every family wishes to have the guest. The guest is allowed to say where he wishes to go.

This time Mr. MacMillan picked one of the smaller houses. It was owned by an Eskimo named Metik (eider duck). Since Metik lived in a small house, he and his wife were much surprised and delighted. They had supposed that Mr. MacMillan would go to the big house of their neighbor.

When Mr. MacMillan came to the door, Mrs. Metik, whose name was Ahl-na-ghi-to, was very busy kicking bones, dog harness, and pups under the bed to make room for the guest in their little house. They were very glad, indeed, to have him. Metik

Fig. A. The long ridge of ice which you see in this picture is a pressure ridge. The dog team rests while the men are hunting a place where they can take their sled over the ridge.

went out to the cache and brought in frozen walrus meat, frozen seal, and frozen birds that had been frozen since the last summer. Mr. MacMillan opened his boxes and got out some tea, coffee, sugar, canned milk, and biscuit. While Mr. MacMillan stayed, a dish of cooked walrus meat was kept standing in the middle of the floor. Anyone could help himself when hungry.

The first night Mrs. Metik dried Mr. MacMillan's boots. She rubbed them soft with a bone scraper and padded them with soft grass. She also mended his clothes with thread from the sinews of the back of the narwhal (small whale).

Everyone in the village treated Mr. MacMillan and his party with the greatest kindness. He says that the Eskimos are kind, hospitable, and honest, and that no better friends can be found anywhere. E-took-a-shoo, one of the Eskimos, drove Mr. MacMillan's dog teams for a year. When Mr. MacMillan's boat sailed away for New York, tears streamed down the old Eskimo's face.

Read again page 21 which tells about the north pole, and point to the pole on your school globe.

The map shows you that the north pole is far, far north of Greenland. It is a very hard place to reach because the sea is frozen and so full of ice that no boat can go there. To go over the ice is difficult because the wind may blow and cause the ice to open and make wide stretches of clear water which will not freeze over for a few days. Sometimes the wind blows so hard that great fields of ice are blown together. These ice fields may be as large as a township or a good-sized

city. They strike one another with terrific force. The ice piles up at the edge of these floating ice fields as they strike one another, just as two newspapers buckle up if you put them on the table and push them against each other with force. These piles of ice are called *pressure ridges.*

The open water and the pressure ridges are the two great troubles of traveling across the Arctic Ocean towards the north pole. The American, Mr. Peary, who was the first to reach the north pole, did it with the help of dog teams and Eskimo drivers and helpers. He started out from the land and went northward over the sea with many teams of dogs and many men. As soon as the dogs and men had eaten nearly all the supplies from one sled, that team and sled would go back. When they came to pressure ridges, they would have to unload the sleds and carry everything over the ridges and then load the sleds again. When they came to open water, they would have to wait for it to freeze. Peary tried many times to reach the north pole. Finally in 1909 he succeeded. As long as he lived, Mr. Peary never grew tired of telling how wonderful the Eskimo people are. They have strong bodies and good minds. They are a brave and courageous people. Even though they have few comforts and must meet danger and work very hard, the Eskimos are cheerful and contented.

Mr. Stefansson, another American, did a different kind of exploring. He learned something from the polar bear. Indeed, he learned how to live in the country as a polar bear does. The polar bear is a funny fellow. He knows the habits of the seal. Now the seal is a fisherman. He spends most of his time in the water under the ice, for he can hold his breath for a very long time. But a seal must breathe air just as a dog does, only not so often. So he has breathing holes in the ice which he keeps open by gnawing the ice away. He comes to the hole in the ice to breathe. Sometimes he comes up through his air hole and lies on the ice to take a nap. Now while he takes a nap, the polar bear may come creeping along and catch him while he is asleep. Then the bear has a good meal. The bear eats the seal, but he is not the only one who eats. The polar bear usually has a party with him. They come without being invited. Four or five Arctic foxes usually follow every polar bear. When he kills a seal, they stand off and bark at him while he eats, but they are careful to keep out of his reach. One slap of a bear's paw would end a fox. After Mr. Bear has eaten all he wants, there is some left. When he goes away, the foxes eat the leavings. They then follow the bear until he catches another seal. Thus the bear and the foxes sometimes travel over the ice far out over the ocean, living on seal meat. In this way polar bears from Greenland sometimes get over to Iceland

Fig. A. The two explorers are catching seals on the ice off the coast of Labrador. See the Eskimo dogs. Why are the dogs watching the men?

and eat the sheep flocks of the Icelanders.

Mr. Stefansson found out how the polar bear lived on the ice, and he thought that he and his dog teams could live the same way. He took a sled, a dog team, a tent, a rifle, some cartridges, and went out on the fields of ice in the Arctic Ocean. Like the bear, he would lie flat on his stomach and creep up toward a napping seal until he got near enough to shoot him. Then he and his dogs would have a hundred pounds of meat—enough food for men and dogs for nearly a week. By that time Mr. Stefansson would shoot another seal and again load his sled with meat. Thus he spent many weeks traveling around where no one supposed a man could live. Mr. Stefansson also tells what good friends he found the Eskimos to be.

THINGS TO DO OR TO THINK ABOUT

1. Locate Iceland on the globe. What is Iceland? Is it east or west of Greenland? Is it north or south of the arctic circle?

2. Add Iceland to our list of *Islands That We Can Locate.*

3. We can now add two other Eskimo animals to our *Animals of the Arctic* chart.

4. Make three or four drawings to show how ice fields act and how they make pressure ridges.

5. Make another drawing of an ice field. Beside it, draw an iceberg. What is the difference?

6. Make up another play for the school assembly. This time it can be about some explorers in an Eskimo village. Maybe we can use the things in our exhibit for the play.

7. Take the school globe and close all the windows of a room but one. Then play that the window is the sun. Hold the globe in different positions and imagine that where the light falls on the globe it is day. What part of the globe is having night?

8. Select one of the pictures in the chapter "The Far North and the Far South" and write a story about the picture.

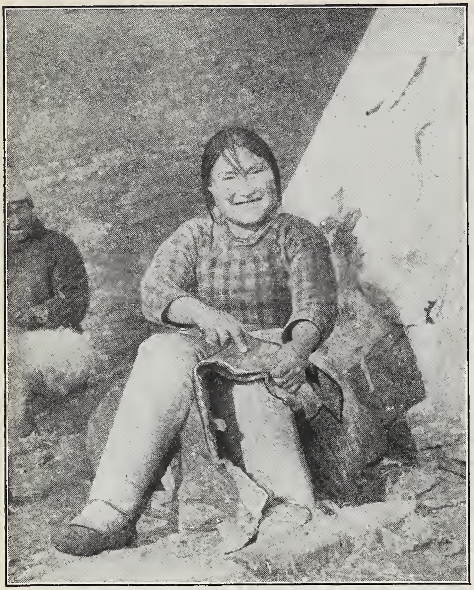


Fig. A. This inland Eskimo woman is making clothing from a piece of caribou skin.

Fig. B. This Eskimo baby is not quite sure that he likes to have his picture taken.

THE INLAND ESKIMO

The Eskimos of Greenland usually spend their winters in the same place year after year. Sometimes they run out of food and have to go hunting in March or April.

In the country northwest of Hudson Bay are some Eskimos who live inland away from the sea. To these people the caribou is everything that the seal, walrus, and whale are to the shore Eskimos. The caribou is a wonderful animal. He can stand fifty degrees below zero and a strong north wind; he really seems to like it. The skin of the caribou has little air bubbles in it, and they help to keep the heat in the animal's body. Besides he has warm, thick hair.

During the short arctic summer trees cannot grow, but there is much moss and some grass and other plants. When winter comes this freezes and is covered with snow. Now the caribou has long, sharp hoofs, almost like trowels, and he can dig through the snow with them and get the moss to eat. He eats moss all the long winter.

The caribou travel in great herds, sometimes several hundred in a bunch, sometimes several thousand in a bunch. The great business of inland Eskimos is to find the herd of caribou and kill enough of them to lay up a winter supply of meat and skins for clothes and tents. It is hard work to catch a caribou. The Eskimos have no rifles. They have only bows and arrows, and not very good bows at that, for they are made of bone. These Eskimos cannot shoot a caribou from a great distance. Since it is an open country, and the caribou can see them easily, they shoot

Story about the Hunt

A lot of Eskimos get together and travel about until they are within a few miles of the caribou herd. Then, just behind the top of a hill, they build long rows of piles of stone so placed that, when some of the men drive the caribou herd over the hill, the caribou find themselves between the two rows of stone piles. At first the stone piles are a long way apart, and the caribou start toward one row of stone piles. The women and children who are behind these stone piles make a noise like wolves, but if the caribou start away from this row of stones toward the other, the women and children behind the second pile of stones make a noise. Then the men behind the caribou whoop and yell, so there is nothing left for the caribou to do but to go straight ahead between the two rows of stone piles. At last the caribou are so near that the men can shoot them with their bows and arrows.

Fig. A. The caribou hunt. At the left of the picture is a story about this hunt. Read the story and look at the picture. Then tell the story in your own words. Make up a play about the caribou hunt.

the caribou as shown in the picture (Fig. 67-A).

These people spend the winter in snow houses. To make a house they start with a snowdrift and dig a hole in it that goes down to the ground. They pile blocks of snow on top to make a roof, and they chink soft snow between the blocks. Finally they cover the whole house with more snow until they are really living in a snowdrift. Sometimes they build one of these small, low houses in an hour. This is the warmest kind of house they could have. It is lucky it is so, for these people do not have much fuel. The caribou is not so fat as the seal. He does not have a layer of blubber. Often these people will have only one little lamp for a family. In the lamp they burn dried moss and a little caribou fat. Often they will have no fire for days. They eat raw meat, but they are cheerful and say they do not mind it.

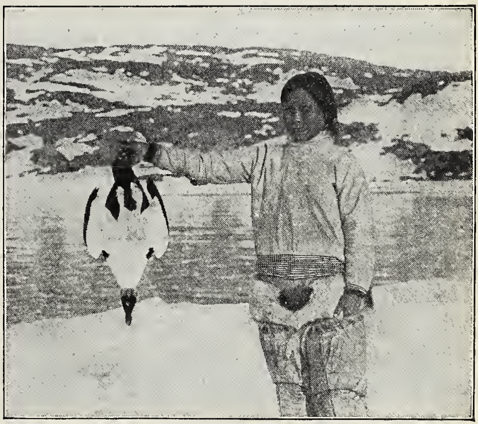


Fig. B. This Eskimo girl has caught an eider duck.

When the warm weather comes, the snow house melts and these Eskimos put up a tent made of caribou skin and go away to some other place where they will hunt caribou or gather birds' eggs. Thus they may live in two or three places

every year. Their summer houses are very much like the tents of the Indians and the Laplanders, of whom we shall soon read.

Summer in Eskimo Land is a most surprising time. After it has been dark for a month or two, the sun comes back for a few minutes, and then the Eskimos have a great celebration. It is the feast of the returning light. As summer comes on, the days rapidly get longer and longer until the sun stays up for a week or two, for a month, or even longer. It shines night and day, although it is not very high in the sky at any time. This night-and-day sunshine makes much heat. It melts the snow. The grass grows, and flowers spring up and bloom. The ground is still frozen underneath a foot or two of mud. The water stands in pools, and mosquitoes hatch out from eggs that were left the year before. They buzz and bite by the millions.

Soon after the plant growth begins, wild ducks and wild geese and smaller birds of different kinds come. After the dead silence of winter and spring, Eskimo Land is noisy with their squawks and cries. These birds spend the winter in the southern part of our own country. In spring they fly far away to the Northland. They spend the summer there swimming about in the pools, eating grass, catching mosquitoes, laying eggs, and rearing their young.

These birds give the Eskimos something else to eat. The children gather eggs by the hundreds, and they also catch birds. They make nets that look something like big tennis rackets with long handles. Then they hide behind stones, and as the birds go over, flying low, the children throw up their nets and catch the birds. This is a girl's job. Sometimes an Eskimo girl will catch a dozen ducks or geese in an hour. These they bury in holes which they dig deep in the frozen ground. Thus they have a kind of cold-storage plant which keeps the birds until wintertime.

THINGS TO DO OR TO THINK ABOUT

1. Here is another new game to play. Some of the following sentences are true and some of them are not true. Read the sentences carefully. Pick out the ones that are true. Then pick out the sentences that are not true.

(*a*) In the Amazon Basin, the people wear heavy clothes. .... (*b*) In Eskimo Land, the people have to wear very thick clothes. .... (*c*) The people of the Amazon Basin can buy their clothes from the people of other lands, by selling them rubber in exchange for the clothes. .... (*d*) There are regular steamship lines sailing from New York to Eskimo Land. The Eskimos can, therefore, buy their clothes in other lands and send back Eskimo things in exchange. .... (*e*) The Eskimos eat more meat than do the Amazon rubber gatherers. ....

2. Tell why each sentence is true or false.

3. Make an Eskimo summer home and add it to the exhibit.

4. Why do the Eskimos move several times a year?

5. Try to find a picture of Eskimo Land in the summertime that will show the flowers that bloom there.

Fig. A. In winter the reindeer dig through the snow to get at the moss and grass beneath.

THE LAPLANDERS

In northern Europe there are some people who are much like the Eskimos. They are called Lapps. We might say that they are a kind of cousin to the Eskimos. Their land, called Lapland, is much like the barren ground of northern North America.

There is one great difference between the Eskimos and the Laplanders. The Eskimos live by hunting the caribou and other wild animals, but the Laplander is a kind of farmer or herder. He has reindeer. Long, long ago the great-great-grandfathers of the Laplanders, or somebody else in Asia, caught the wild caribou and made him tame. Because of this the Laplander has herds of reindeer.

The reindeer eat moss and grass and dig in the snow exactly as the caribou do. As a rich Lapp may have a hundred or even a thousand reindeer, it does not take them long to eat all the pasture that can be found near his home. He must then move the reindeer to find more pasture. The Laplander must move also to be with his flock. Therefore he moves much oftener than the Eskimo. He has to move even in the darkness of the long winter night. Think what a job that is! In the snow, darkness, and bitter cold he and his family must take up their tents and all that they possess, and move to some other snowy place in search of food for the reindeer. People who keep moving must live in tents, and because they keep moving they are called *nomads*.

The Lapp's tent is stretched over a bundle of poles and looks very

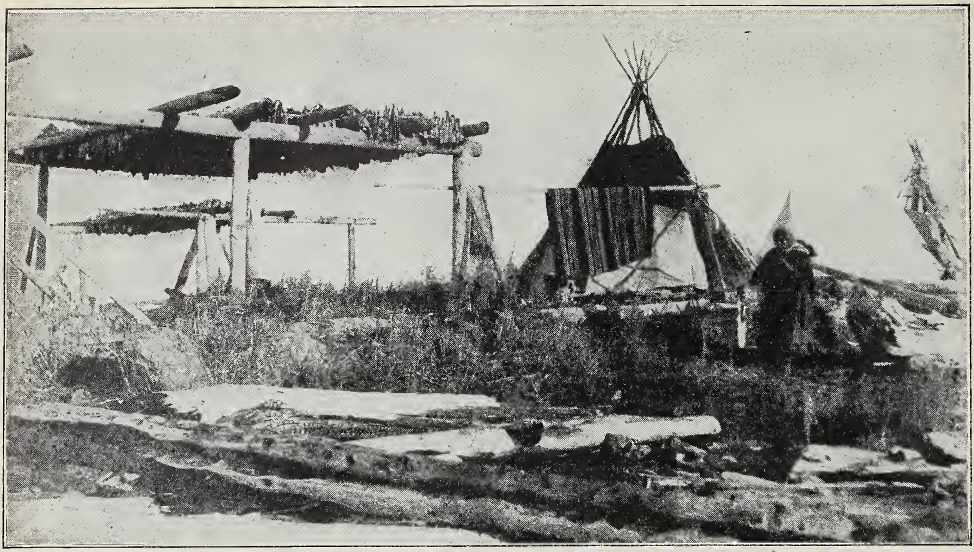


Fig. A. During the short, cool summer the Lapps live in tents which look very much like the tent in this picture.

much like the tent of the American Indian and the Eskimo. If you come near, you may find three poles set together outside the tent, and on top of them some frozen reindeer meat and some buckets of frozen milk. Sleds and harness lie around the tent door. Inside the tent there will be a fire in the middle of the floor, and a pot over it in which to boil the reindeer meat. The baby will probably be wrapped in dried grass and reindeer skin and strapped in a little box which hangs up near the top of the tent out of the way. The tent may be almost as full of people as an automobile. Eight or ten people fill a very small tent. When they have to move so often, they cannot have a big house. On the floor will be reindeer skins to keep out the cold. When bedtime comes, the Lapp takes off his boots, puts on a big reindeer-skin coat, and lies down on the floor with all the other people; and if a dog or two can manage to creep in also, he does so.

Several Laplanders always move together, because at least two men with their dogs must be out night and day guarding the herds. The wolf is the great danger and the great fear of the Laplanders. Wolves go in packs. Sometimes during a snowstorm they break into a reindeer herd, kill several of them, and chase the rest of them so far away that they never come back. Thus a Lapp who is rich today may be poor tomorrow. When the cry of "Wolf!" comes, everybody jumps up. Men and women put on their skis, call the dogs, and away they go to

help protect the deer, for there are no barns in Lapland and no fences. Why does not the Laplander build fences as the American farmer does? If he built a wire fence, he would have to buy *wire* and *posts*. He would have to haul them. He would need very long fences because each acre of his cold land yields so little. Worst of all the reindeer is a good jumper.

When the Laplander moves, he travels in sleds which the reindeer draw, for these useful animals not only give meat and milk for food and skins for clothing and trade, but they are also his horse, his automobile, his train, his motor bus, his bicycle, his roller skates, and his airplane.

The hardest task the Laplander has is to train reindeer to pull the sled. When a reindeer is three years old, the men catch him, put a rope on his horns, a collar on his neck, and harness him to a sled. He bucks and kicks and fights until he is exhausted. This goes on many days before he gives up and is willing to work for his master.

THINGS TO DO OR TO THINK ABOUT

1. Copy and fill in the blanks in the following sentences so that each sentence makes sense. You may have to use a good many words for each blank space.

When my family needs food, my mother ....

When the Amazon rubber gatherer needs food, he ....

When the Eskimo needs game for his dogs or his family, he ....

When the Laplander's reindeer need food, he ....

Fig. A. These two lads in Lapland pose for their pictures. How do you know that the weather here is very cold?

2. Tell why each of these filled-in sentences is true.

3. Why is it true that the Eskimo has to move to find food for himself as well as for his dogs, while the Laplander has to move only when no food is left for his reindeer?

4. What is a nomad?

5. Add the caribou and the reindeer to your *Animals of the Arctic* chart.

6. Put the two charts, *Animals of the Arctic* and *Animals of the Amazon Forest,* side by side. Look at the two charts and tell how the animals of the one are different from the animals of the other. Why are they different?

7. What helps the Lapps and Eskimos to find their way when they have to travel during the long winter night?

8. Tell some ways in which the Lapps are like the Eskimos and also some ways in which they are different.

9. In what continent did we find Lapland? Run your hand over this continent on the globe or the map, and then add its name to your list of *Continents That We Can Locate.*

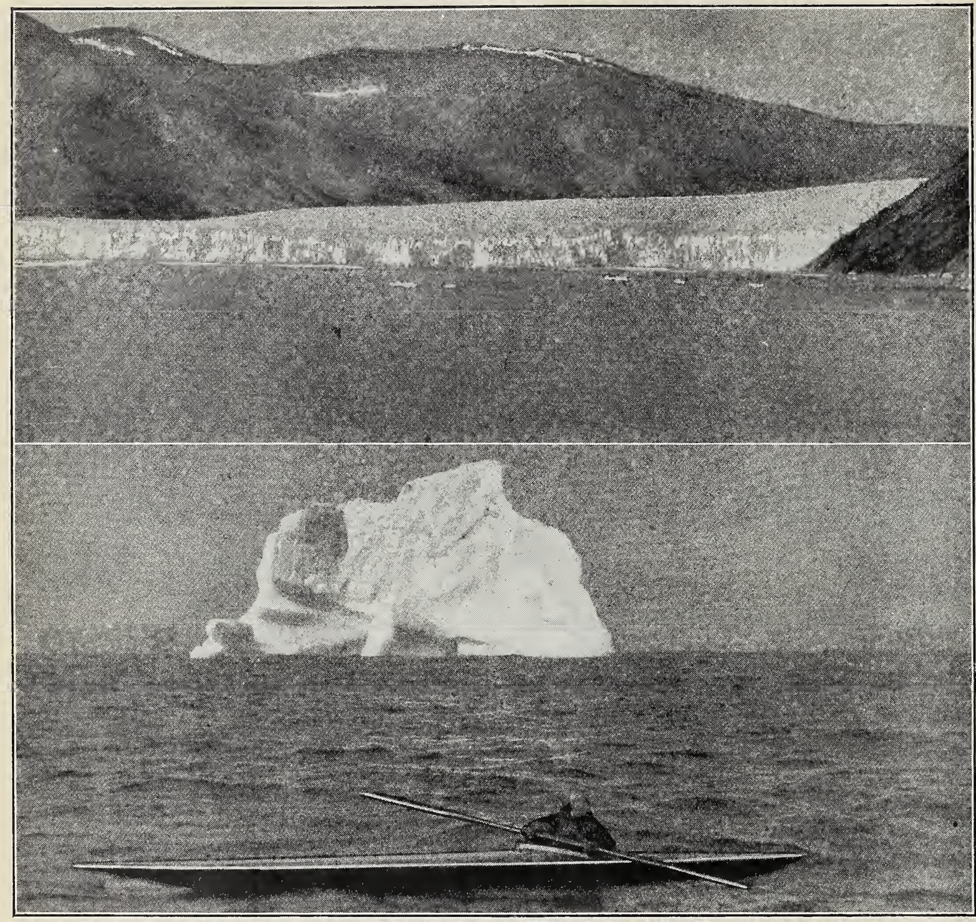


Fig. A. In the lower picture you see a great physician, Sir Wilfred Grenfell. Your teacher will tell you some facts about the work of Dr. Grenfell. He has paddled out from the Labrador coast in his kayak to see a visitor from Greenland. What is the visitor's name? The visitor broke away from the big glacier which you see in the top picture and floated away. What will happen if the visitor floats too far to the southward?

THE ICE CAPS, THE GLACIERS, AND THE ICEBERGS

There is one part of Eskimo Land where the snow does not melt each summer. The greater part of Greenland is covered with snow all the time. During each winter more snow falls than the summer can melt; so the piles of snow get higher and higher. Snow has piled up there year after year until it has become as high as mountains. Now after snow has piled up to a certain height, it freezes very hard at the bottom and is squeezed together into ice. Then a strange thing happens. The great mass begins to move a little. It moves so slowly that you

could not see it move if you looked at it. Suppose you were to put three stones in a straight row, two on land and one on the ice. Look at them the next day. They will not be in a straight row any more. The ice has moved a little, perhaps a few inches a day, or a few feet, or possibly a few yards.

When ice piles up like this and begins to move down a mountain side or across the land, we call it a *glacier*. If it comes to the sea, a big piece breaks off and floats away. We call that piece an *iceberg*.

You remember there were icebergs in the sea off the coast of Labrador. They came from the Greenland ice, or *Greenland ice cap,* as it is called. This Greenland ice cap is several times as large as your home state. Each year it sends many glaciers to the sea, and they float away down past Newfoundland. Sometimes people who are crossing the ocean from our country to Europe see huge icebergs floating southward.

We have been talking about the arctic lands and the north pole, but our old world has two icy regions. One is near the north pole and the other is near the south pole. The cold region around the south pole is called Antarctica. The antarctic circle is just as far south from the equator as the arctic circle is north from the equator.

The north pole is in the ocean. The south pole is on the land, a highland and much larger than the United States. All this land is covered with ice.

This ice covers so much of Antarctica that no one has ever lived there except for the short time that explorers have been there. Two different parties of explorers with Eskimo dogs to help them have traveled over this ice to the south pole. Now that we have flying machines, Rear Admiral Byrd, an American, and an Englishman named Wilkins have explored much of this great land of ice by flying over it in airplanes. (See page 21.)

Rear Admiral Byrd discovered new mountains and claimed some of the land of Antarctica for the United States. He found that the ice was more than a mile deep in some places, and that a large area that seemed to be land was ocean with ice hundreds of feet deep. Possibly your school library has a book with pictures about Byrd and other polar explorers.

When sailors go near Antarctica, they find only a great wall of ice many times as high as a ship and hundreds of miles long. Sometimes it breaks off into icebergs that are bigger than a township, bigger than a city, bigger than a small country, the biggest icebergs in all the world.

THINGS TO DO OR TO THINK ABOUT

1. Make drawings to show how ice caps, glaciers, and icebergs are different. Which of the three is most like an ice field?
2. On the blackboard show that there is land around one pole and water around the other. Which is which?

Fig. A. A caravan on the Sahara Desert. Hakim and Suleika saw many caravans, for they lived at the edge of the Great Desert.

THE HOT, DRY LANDS —THE SAHARA

HAKIM, THE ARAB BOY

We are now going to travel with the Arabs. We shall see in how many ways they help us by giving us the things we need. What do we give them in exchange? What do the Arabs also exchange with one another?

We have seen how the rubber gatherers live in a hot, wet land where plants grow very well. We have seen how the Eskimos live in a cold land where there are no farms at all. Now let us go to see a hot, dry land where there are no farms. If a country is very dry indeed, we call it a *desert;* and the greatest of all deserts is called the Sahara Desert. It is in Africa. It is easy for us to go there if we have the money to buy the tickets.

Many big passenger steamers sail from New York across the Atlantic Ocean into the Mediterranean Sea and stop at a city called Alger.

At Alger we can take a railroad train and travel south into Africa. At first we see farms with wheat and hay and sheep and cows. This looks much like parts of our own country. But the next day our train has left the land of farms. We see no trees, no barns, no fences, only a little scattered grass and bushes. This is the Land of the Desert's Edge. How could you live in a country where

Fig. A. On this picture of one part of our globe, point to North America; to Africa. Trace the route of our steamer from New York City to Alger. What direction is Alger from New York?

Fig. B. On this picture of another part of our globe, point to Africa; to Alger; to Cairo; to the Nile River. Trace our journey through the Mediterranean Sea to Cairo.

there was only a little grass and scattered bushes? Hakim's people know how to do this.

Hakim is an Arab boy. The day he was ten years old he was riding on a donkey. A camel carried his mother, Suleima, and his sister Suleika. The camel carried many bundles also. Hakim's family was moving. This was on the edge of the Sahara Desert in Africa, in a country called Algeria. Enough rain may fall at some seasons on the edge of the desert to make some grass grow; but for many miles there may be no spring or stream. In such places it is often much trouble to find water to drink.

Hakim's family was not the only one that was moving. There were four other camels beside the one belonging to Hakim's family, and they were all heavily loaded, for the camel is a great burden bearer. Two small donkeys followed behind Hakim's camel, with loads that seemed big enough to break their backs. But the donkey is a very strong little beast, well able to carry heavy loads. Everything these people had, except their animals, was fastened on the camels and donkeys. Water was carried in a goatskin water bottle, which had been filled that morning at a pool beside the way. Half a mile behind the donkeys came Hakim's father, Abdallah, driving a big flock of sheep and goats.

Toward evening the party stopped at a place near a well where there was water. Here they would camp. The camels knelt. Quickly the loads were taken from their backs. To keep the camels from straying, one end of a short rope was tied to the left

Fig. A. This map is a relief map of Africa. It shows the kinds of surface which Africa has.

Fig. A. This map is a political map. It shows the different countries of Africa.

Photo. by J. Russell Smith

Fig. A. A camp of Bedouins near the edge of the Sahara in southern Tunisia. The tents are surrounded with piles of thorn bushes to keep the goats, sheep, donkeys, and camels out of the tents.

front leg; the other end was tied to a stake in the ground. The tents were unrolled, spread upon the ground, then put up on poles, and the pegs were driven securely into the ground. The sacks, the blankets and coverlets, the cooking dishes, the grinding stones, and the coffeepots were put inside the tent. The watering trough of hide and the leather buckets used in watering the animals were left outside

Hakim and Suleika and their little friend, Yussuf, started toward some bushes they saw in the distance, hoping to find enough sticks for a little fire.

In an hour the tasty smell of broiling goat meat filled the air. By the time supper was ready, Hakim's father, Abdallah, had come up with the sheep and goats. Suleima took a wooden bowl and milked eight goats. For supper they had milk and meat and some barley bread which was nearly as hard as bones.

The next morning everybody got up early and went to work, for the camp was not yet finished. First of all it was necessary to make fences around the tents to keep out the camels and goats. The Arabs have a saying that if a camel gets his head into a tent, he goes all the way in. It is true; and a camel fills a tent very full, too. Besides, he may eat all the flour or meal and some of the clothes as well. Since the goats are glad to help him eat things, the first thing the people do when they set up a camp is to cut thorn bushes, of which there are many in the desert. These they pile around the tents so that the goats and camels cannot enter. When they try to get into the tents, there are the strong, sharp thorns.

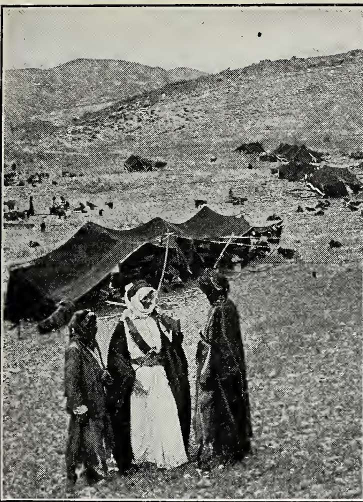


Fig. A. The tents of the Arabs on the edge of the desert. The tents are made of cloth woven by the women from goats' hair.

Fig. B. Ismail, the headman or chief, with his wife. The chief's clothing is loose and flowing. It is striped with white and various colors. Around his head is wrapped the *cufia*.

THINGS TO DO OR TO THINK ABOUT

1. Why do the Arabs have to be nomads? What other nomads have we met? Why did they all have to move so often? Why are the people of your state not nomads?
2. Which do you think that you would like better, an Arab supper or one with the Eskimos? Why are the two meals so very different? What do the Arabs eat that most of us like very much?
3. Make sand-table models of a sea, a lake, and a bay. Then explain how each of these bodies of water differs from the others.
4. Make a floor map of the Mediterranean Sea. What continent is north of it? What continent is south of it? Label these two continents. Also label the Atlantic Ocean and Alger.
5. What two continents are west of the Atlantic Ocean? What two are east of it?
6. Add Africa to the list of *Continents That We Can Locate* and add Alger to the list of *Cities That We Can Locate.*
7. In what country is Alger? Add this new country to the list of *Countries That We Can Locate.*

LIVING ON THE EDGE OF THE DESERT

There were five tents the in group; four were close together, one stood alone about thirty yards away. That was the tent of Ismail, the headman or chief. He was called a "Prince of the Desert." Sheik (pronounced *shake*) is the Arab word. If the people had any difficulties, they came to ask the sheik what to do. He had his tent by itself so that people could not overhear the business done there.

The Arabs camped here for ten days. There were five men and several boys. A man always stayed near the camp. Each morning one of them went away for a few miles with a camel and two donkeys and brought back earthen water jars and goatskins filled with water.

Photos. by J. Russell Smith

Fig. A. Suleika and her pet lamb.

Fig. B. Suleika's father and his flock of sheep. In the days of the Roman Empire a city stood where the sheep are walking. Scattered over the ground are bits of brick from the buildings of the city.

Another man went out with the flock of sheep and goats. Another man took the camels and donkeys out to graze. The she-camels were milked before going to pasture. The milk may be drunk warm or put into a skin bucket to sour, or it may be boiled and cheese made from the curds. With plenty of camel's milk Arabs need not starve. All of these animals hunt their living in the scanty grass and coarse bushes. Each herdsman sings his own song; his camels know the song and follow his voice.

Hakim and Yussuf went with the men to learn how to take care of the animals. It was the only school the boys had. While the camels grazed, the men taught the boys how to track camels, so that each boy could pick out the tracks of his father's camel from among many camel tracks. The boys had to run races to make them fleet and long-winded, so that they might be able to follow runaway camels. It is a terrible thing to lose one's camel in the desert.

Hakim's father taught him some chapters of the Koran, the Arab Bible. Abdallah could not read, but he knew many chapters of this book by heart, and also many interesting stories of the kind that we read in a book called *Arabian Nights*.

Suleima, Hakim's mother, and the other women went at their work, too. One of the women sat down with a lap full of wool from the sheep. She took a stick, which she whirled somewhat as we spin a top, and began to spin yarn. Another woman spun goat's hair into a strong rope to be used to tie the camel fast at night. Still another wove striped cloth of goat's hair to be made into a tent. All their tents were made of goat's-hair cloth. While

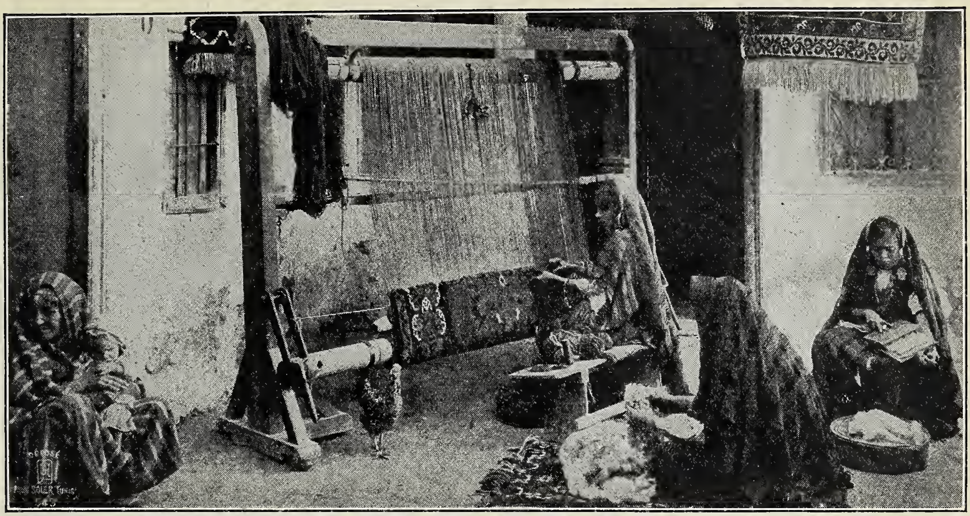
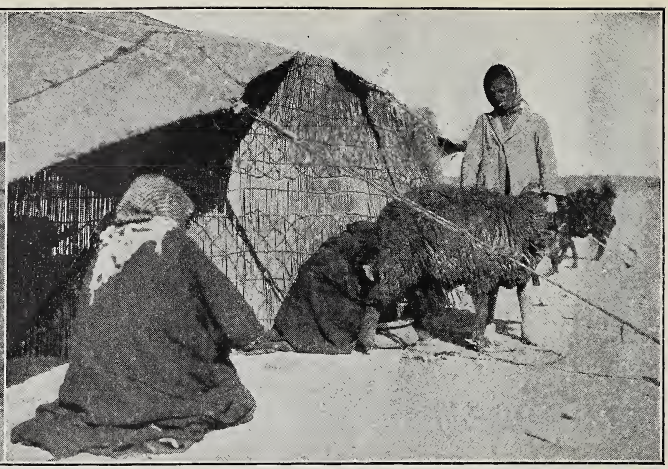


Fig. A. These women live in Tunis, a city in Africa near Alger. (See Fig. 77-A.) One of the women is weaving a rug on a loom in her home. Two others are carding wool.

the women worked, the girls helped them and in this way learned to spin and weave. In the spring the girls gathered the loose hair from the camels, and from it they made saddlebags and blankets. Sacks for holding grain are made of goat's hair.

After Hakim's mother had spun yarn for two weeks, she began to weave the yarn into cloth for a long, white, wool robe, or burnoose, such as all Arab men and boys wear. This one was for Hakim, and she worked hard for a week to weave it. When it was finished, it was so strong and firm that it would last for years.

When Suleima, with the help of her daughter, had made all the ropes, sacks, halters, clothes, and tent cloth that the family needed, she began to make something to sell. She had kept the wool of the white sheep separate from the wool of the black sheep. This gave her white yarn and black yarn. She dug up a root and boiled it in a pot. White yarn, soaked in the water in which the root was boiled, became red. Some of the yarn was soaked for three days with sticks from a desert bush and became yellow. Some other yarn Suleima dyed green with a very precious powder, for which she had traded two goats and a sheep. She had bought it from some Arabs she had met the year before as they returned from a distant part of the desert. She now had yarn of five colors: white, black, red, yellow, and green; and she began to weave a rug. She wove into it figures of camels and flowers and trees. Although the rug was only seven feet long, Suleima was six months in finishing it. When it



Photos. by J. Russell Smith

Fig. A. This Bedouin is wearing a burnoose such as Suleima made for Hakim. The headdress keeps the sunshine off the neck.

Fig. B. In another part of the desert a Bedouin woman was milking a sheep. A boy, about the age of Hakim, held the sheep's head. The tent in which the family lived had a roof of goatskin cloth. The walls were made of reed matting with goat-hair strings.

was done, it was so valuable that she knew she could sell it for much money when she reached a town, or that with it she might buy a small flock of sheep, or several donkeys.

All of these things were not finished in one camping place. Within ten days after the Arabs first made their camp, the animals had eaten all the food that could be found within five miles. In order to get food for the herds the family had to move. The tents were rolled up. Hakim climbed up on the camel beside his mother. There he rode with all the tents and the bundles. Twelve miles to the north they rode, until they came to some water. There they again pitched the tents and cut thorn bushes and hunted firewood.

These people can never stay long in one place because grass for the sheep, goats, donkeys, and camels is so scarce that they soon eat all there is. The herds and their owners must, therefore, keep moving. For this reason we call them *nomads*. The people in many dry countries are nomads.

The nomad Arabs of north Africa are called Bedouins. Hakim and his family are Bedouins. Their only wealth is flocks and herds and the things they can carry when they move. No one ever has a piece of land for his own except while he camps on it.

In the country on the edge of the desert it is warm and there is no snow, but it rains a little in the winter. This makes some grass grow at that season. There are several kinds of bushes that can live all summer in the blazing sun without a drop of rain. In the winter when

it rains, grass and water are found in places that are entirely without water in the summer. In such places the Arabs pasture their flocks and camp in the winter. Then, as spring comes and the rains stop, the grass withers and dies, and the nomad people go north toward the Atlas Mountains and the Mediterranean Sea to find grass and food. Find these mountains and this sea on the map of Africa.

At the fourth camping place, Hakim and Abdallah came to the tent of their friend, Selim. They had started south with the coming of the rains. Enough rain falls in this part of Algeria in some years to make a crop of barley, though it is a poor one. Barley is a kind of grain very much like wheat, except that it will not make soft, light bread. Barley does not need as much rain as wheat needs. It is grown in many dry countries where wheat fails.

Before the Arabs went south, they had harnessed the camels to wooden plows. These plows were really nothing but crooked pieces of wood. With them the Arabs managed to scratch up a little ground in which to plant barley. Selim and his family camped by the field all winter. They had two watchdogs to keep other people's sheep, goats, and camels from eating the young barley plants. The barley belonged to all six families of this little nomadic tribe. While Selim stayed there and took care of the barley

Fig. A. Hakim's baby camel and its mother.

crop for the tribe, the others took his flocks along with theirs in search of pasture.

Selim took care of one of Hakim's camels that winter. A baby camel (colt) was by her side now. The Arabs breed camels and sell them to merchants at the trading places, or exchange the camels for things they need.

The tribe came back north in time to help Selim harvest the barley. There had been no bread to eat for two weeks before they returned; so the very first morning Suleima and another woman went out and pulled a blanket full of barley heads. These they spread out on a smooth, hard piece of ground and beat the grain out with sticks. Within an hour they had ground enough grain between the two stones of the hand mill to make a barley loaf, and they all had bread for supper. The donkeys and the camel were very grateful to have the

Fig. A. Camel and horse plowing together on the edge of the desert. Hakim's father will plant barley in this field.

barley straw for supper. They thought it was a good change from twigs and leaves and the tip ends of thorn bushes.

For a few days everybody was busy harvesting and threshing the barley, of which each family had three big goat-hair sacks full. That was more than the camels could carry with all their other load. What should they do with the barley? They had no house, and they had to keep moving all the time. The only thing they could do was to hide the grain. After drying the barley well by spreading it out on blankets in the sunshine for several days, Abdallah, Suleima, and Hakim worked all one night hiding their part of it. After dark they put two full sacks on the camel, led him off to a secret place, dug a deep bottle-shaped hole, lined it with six inches of straw, put in the precious barley, covered it with straw and earth, and carefully carried away in sacks all the earth that was left, so that no one could find their store. In the morning they were back in their tent as though nothing had happened. No one knew their secret. The next fall as they went south again, they would dig up the barley, safe, sound, and dry. In this way they would have a good supply of barley for seed and for their winter bread.

After the barley was harvested, our nomad campers, now increased by Selim's family, went roving on to the northward, always seeking pasture.

One day they met a large band of Arabs. One of the men rode a white horse and wore finer clothes than anyone in Hakim's camp. This

man was Feisal, the sheik of sheiks. Feisal was the sheik over Ismail, Hakim's sheik, and also over many other little groups like Hakim's group. Hakim's father killed a fat kid, and they gave Feisal's party the best meal they could provide. Feisal was very proud of his horse. Only rich Arabs can have horses, because horses cannot live on thorns and coarse grass as the camel does. Horses must have barley, and this is very expensive indeed on the desert's edge.

After a while, Hakim's party came to a town. This town is on the railroad that comes down from Alger. The French people had helped the people of Algeria to build this railroad. The French rule most of Algeria except the people who live out in the tents and move around. In this railroad town the nomads sold some sheep and wool, and Suleima sold her rug. With the money they bought rifles and cartridges, knives, beads for Sule[illegible]d many other trinkets. Suleima wanted a teakettle and tin dishes, because these are useful articles and light to carry. After much talk Abdallah bought a little phonograph and some records, made in New Jersey. These were not easy to carry about in the desert, but Arabs dearly love music, and the family rejoiced at having enough money left to pay for the new treasure. Hakim had been a good boy and had worked so well at helping tend the sheep that his father gave him a tin watch. Soon

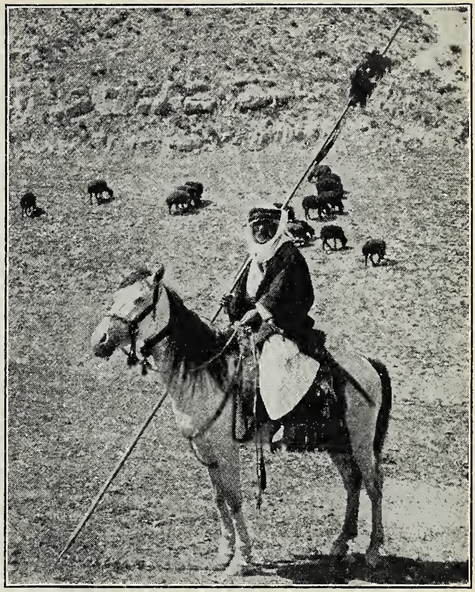


Fig. B. Feisal, the sheik of sheiks.

the family started away again for another year of tenting in many places and of living from their flocks and herds.

THINGS TO DO OR TO THINK ABOUT

1. Choose one boy to be an Arab boy and one girl to be an Arab girl. Then let each of them tell the rest of the class all about school on the edge of the desert. They may use pictures or samples of the things they are telling about to make their stories more interesting. The rest of the class must listen *very* carefully. Possibly some of the pupils will want to ask questions of the Arab boy and girl after they have finished telling their stories.

2. Tell one important way in which an Arab school is like an Eskimo school.

3. Add the Atlas Mountains to the floor map and to the list of *Mountains That We Can Locate*.

4. What seems to be the Arab's main treasure? What was the Eskimo's?

Fig. A. The Sahara is almost as large as our own country; but it is not all covered with shifting sands. The surface of some parts of the desert is bare and as hard as a road.

THE SAHARA

South of Hakim's country is the Sahara, the largest of the deserts. Hakim wants to cross the great desert when he is old enough. You would not want to do that, for it would not be a pleasant nor a safe journey for you. People who cross this desert must travel for hours over bare, dry clay, baked almost as hard as a floor. At other times they must pass for miles and miles over bare rock, so hot under the blazing sun that it would cook an egg almost as quickly as a hot frying pan does. The stones get so hot that they make terrible burns on bare feet, and the people have to wear shoes of camel's skin. The sun is so hot that the people wear thick wool even in summer to keep the heat out. They wrap many layers of wool around their heads even in the heat of the day, so that it may keep the heat of the sun away from their skins.

Dry air cools off very rapidly. Because of this the desert, which is very hot by day, is often cool at night. Sometimes there is even frost at night in places where the sand and stones would burn your feet in the heat of the day.

You will understand this better if you will do the following: On a hot summer day put your hand on a roof of metal or slate or slag on which the sun is shining, and then put it on some green grass on which the sun is shining. Then feel the same

Fig. A. Moving day on the Sahara. See the goat's-hair grain sacks and the stone water jars on the camels.

things in the early morning before the sun is up.

On the rocky parts of the desert the hot winds blow away every grain of sand or dust that comes loose from the stones. Most of the way across the desert there is sand, sometimes piled high by the desert wind or stretching away in wavy piles called *sand dunes*. There are waves of sand as far as the eye can see, and they look somewhat like the ocean. This sand moves every time the wind blows. The wind picks it up from one side of the sand dune and blows it over the top to the other side. Thus the sand dunes are always moving a little every time the wind blows. Hakim is used to this kind of country and climate, but you would not think it a pleasant place.

Men could not cross this desert without the help of camels, which are called *ships of the desert*. These animals have lived in dry countries so long that they are able to carry men and goods across the desert for several days without eating or drinking. The camel can do this because of his hump, which is a kind of camel's pantry. When he gets plenty to eat, he gets fat and stores the fat in his hump. Then he can go for a week, walking every day and carrying a load, and never eat nor drink; but each day the hump gets smaller and smaller, for he is living on the fat that he has stored there. Then, too, the camel can make a good meal of the twigs of the desert thorn bushes. His mouth and teeth are not like those of any other animal, and he can eat thorns as though they were soft grass.

It is wonderful that there is an animal that can get on so well in

Photo. by J. Russell Smith

Fig. A. The camel driver cuts a few thistles beside the road so that the camel may have a quick lunch.

such a hard situation. The camel would rather walk on soft sand than on a good, hard road. His feet are made for soft sand. They are much like a cushion. When they come down on the sand, they spread as a cushion would and keep him from sinking in. Sharp hoofs like those of a sheep or goat would sink and make it much harder to walk.

Sometimes there are terrible sand storms in the desert. Clouds of dust and sand as large as thunderclouds sweep down upon the travelers. If it is a mild sandstorm, the animals will turn their tails to the wind and stand still. The men cover their heads with their loose robes. If it is a hard storm, the animals lie down. The men lie beside the camels and cover their heads with cloths to keep out the stifling sand and choking dust. Here both men and animals must swelter, sometimes for hours or even for a whole day, until the hot rain of burning yellow sand and dust stops. Sometimes it kills people.

Sometimes the dust covers up the trail, and the travelers lose the way to the springs or wells. The man who crosses the desert must know the road that will take him to the springs or wells. If anyone is lost in the desert, he dies of thirst. The journey is long. It takes many days. It is one of the hardest journeys in the world.

Fierce robbers sometimes attack travelers in the desert, for there can be no policemen in such a place. For protection, travelers go in large numbers, often fifty or even several hundred together. Such a body of people is called a *caravan.* These caravans take cloth, metal wares, and beads into Africa, and bring back to the Mediterranean ports ostrich feathers, skins, and fine leather. These they get from the tribes south of the desert.

The best parts of the desert are the oases. An *oasis* is a place where there is water. It is a welcome sight for the thirsty men of the caravan to see across the glaring sand the dark green tops of palm trees growing where a spring brings water to the surface of the desert.

Whenever the nomads find a spring of water, they plant date trees; and some of them settle down, build villages, and live in one place as we do. Their one-story houses made of sun-dried brick have flat roofs and are always built out in the desert, so that they will not occupy any of the land that becomes so precious when irrigated.

Fig. A. An oasis in the desert. The water which you see in the picture comes from an underground spring. Compare this scene with Figure 86-A. In front of the camel and at the water's edge is a small young date palm.

These Arabs of the oases live mainly on dates and the things that will grow beneath the date trees—apricots, olives, beans, and other vegetables. There are also little patches of alfalfa, which the Arabs cut and carry to the milch goats. Sometimes these goats pasture on the bushes of the surrounding desert, along with the flocks of the nomad Arabs who do not own any of the precious date gardens and who, you remember, live almost entirely on meat and milk, a little barley, and such things as they can buy. Oasis towns are the trading centers of these regions. The nomads often come to trade goats, sheep, camels, wool, or skins, for dates, vegetables, hay, and barley loaves. In the cool of the morning the market beside an oasis village is a lively and interesting place. At noon in the heat of the day everyone is taking a nap. In the cool of the evening all are busy again—chatting, walking to and fro, carrying jars of water, and listening to story-tellers and music.

Hakim often visits oases, for there are many big springs along the south slope of the Atlas Mountains where Hakim's people follow their flocks. In years when the grass is poor, Hakim's people go to the oases at

the time of the date harvest and earn money picking dates for the oasis people.

Sometimes dates from these oases come to the United States. Farther out in the desert the oases are smaller, sometimes having only a few date trees around the spring.

Would you like to visit an oasis and see a long camel caravan come in across the sands? Would you like to hear the Arabs tell how narrowly they escaped from sandstorms and robbers, and how they lost the water bottles, and how, in the end, the camels brought them safely through?

Look at the map of South America (page 36) and of Africa (page 76). Which continent has the greater number of rivers? We learned, you will remember, that there are enough rivers in the Amazon Valley to make a watercourse long enough to reach around the world. North Africa has only one great river, the Nile, and that comes into the eastern end of the desert from a country far to the south of it, where there is much rain. The water from the Nile flows across the desert to the Mediterranean Sea. The oases of the Nile River will be described in a later chapter.

The Sahara Desert is a very big desert. It is wider between the Atlantic Ocean and the Nile River than is the whole United States between the Atlantic and Pacific oceans. As you see on globe B (Fig. 16-A), this desert continues through Arabia, far into Asia.

THINGS TO DO OR TO THINK ABOUT

1. A teacher once asked a class "What is a desert?" A boy replied, "A desert is a sandy place." Was his answer right or wrong? How do you know?
2. How does it happen that the Sahara Desert gets so hot in the daytime and so cold at night?
3. How does the Arab's burnoose protect him at night as well as in the daytime? Why can't the Arabs dress like the people in the Amazon Basin, since that is a hot land also?
4. Add the Sahara Desert to your floor map.
5. Look at the globe and find the arctic circle. Do you see how far it is from the north pole? Now look at the equator. Then let your eye move north on the globe, to find another dotted line. This new line should be just as far from the equator as the arctic circle is from the north pole. Have you found it? Do you notice that it runs through the Sahara Desert? What is its name? Add it to the floor map.
6. Make a chart to show the *Animals of the Desert and of the Desert's Edge.*
7. How is each animal on this chart useful to the Arabs?
8. Do you know what we mean by Nature? Well, how has Nature helped each of these animals to live in this kind of land?
9. Draw an oasis with an Arab settlement.
10. Fill in these blanks:

    The roofs of the Amazon huts are .... and the roofs of the houses in the desert settlements are .... This is true because ....

11. Where did the Indian fur trappers do their trading? Why? Where do the desert people do a great deal of their trading? Why?
12. Which is wider, the northern part of Africa or the central part of North America? How do you know?
13. Let us make up eight or nine little plays about the Arabs. They ought to be very, very interesting.

Photo. by J. Russell Smith

Fig. A. The Bedouin stops to let me take his picture as he rides across the flat, dry plain near Baghdad. The donkey is a strong little beast.

Photo. by J. Russell Smith

Fig. B. The wooden plow drawn by oxen makes a furrow. The boy is dropping grain into the furrow. This picture was taken in Palestine.

THE ARABIAN DESERT

The Sahara Desert has a sister, the Arabian Desert. In fact, for a very long time caravans of camels have gone from the deserts of Africa across the Nile and on into Arabia. All this is desert except where it is irrigated by the waters of the Nile.

The Arabian Desert is a big desert. It is nearly half as long as the distance across the United States. It is very much like the Sahara indeed. It has the same sand dunes, the same scanty pasture here and there, the same camels, the same sheep, the same goats, the same nomad Arab people speaking the same language. There is one difference between the Sahara and the Arabian Desert. Central Arabia is a highland like the Atlas Mountains in the northwestern part of Africa. This highland, of course, gets more rain in winter than the lower lands near by. There are a few streams and springs and a number of oases along the edges of the central Arabian highland.

These things make it really very much like the Sahara. We found in the Sahara that the people had their winter pasture out in the desert and their summer pasture on its edges and up in the Atlas Mountains. The same is true in Arabia. The desert people spend their summers in the highlands. When the rain comes in the winter, they go down into the lower lands toward the Arabian Sea and the Persian Gulf. Then as the summer comes on, they move back again, a few miles at a time, back to the upland pasture.

If the earth does not receive enough rain in autumn, the grass may fail and the people and animals will be hungry. Hoping to prevent it, the wives and daughters of the Bedouins form a procession to carry what they call "mother of rain." It is a woman's gown stretched over two sticks forming a cross. The women

Fig. A. A caravan in Mongolia nearing the Chinese border.

and girls go from tent to tent singing:

"O mother of the rain, rain upon us;
Wet the mantle of our herdsman!
O mother of the rain, rain upon us;
With pouring rain allay our thirst!
O mother of the rain, rain upon us;
A real flood let our share be!"

Palestine, a country at the eastern end of the Mediterranean Sea, is much like northern Algeria—a land of wheat fields and olive orchards. East of it is a desert sometimes called the Syrian Desert. It is really a part of the great Arabian Desert.

Our map shows that the desert regions of Asia go on far to the northeastward, beyond Arabia, central Asia, and on into China. The part of this great desert country that is in China is called Mongolia. Some of it is like the Sahara, full of sand dunes and worthless. Other parts are like the edges of the Sahara. They have enough grass for flocks and nomads.

Mongolia is very much like Hakim's country. There are flocks of sheep and goats and camels. There are nomads living in tents; but the nomads are not Arabs. They are Mongol people with yellow skins. They are close cousins of the Chinese. There is one great difference between living in Mongolia and on the edge of the Sahara: Mongolia has a very cold winter. Therefore we find the people there must dress in warm clothes. In winter they wear sheepskin coats and sheepskin caps and boots. To keep their hands warm, the Mongolians have sleeves much longer than their arms.

The Mongol tent is a much thicker tent than the Arab tent, and the Mongol camel has thicker, warmer hair than the Arab camel. Also he has two humps.

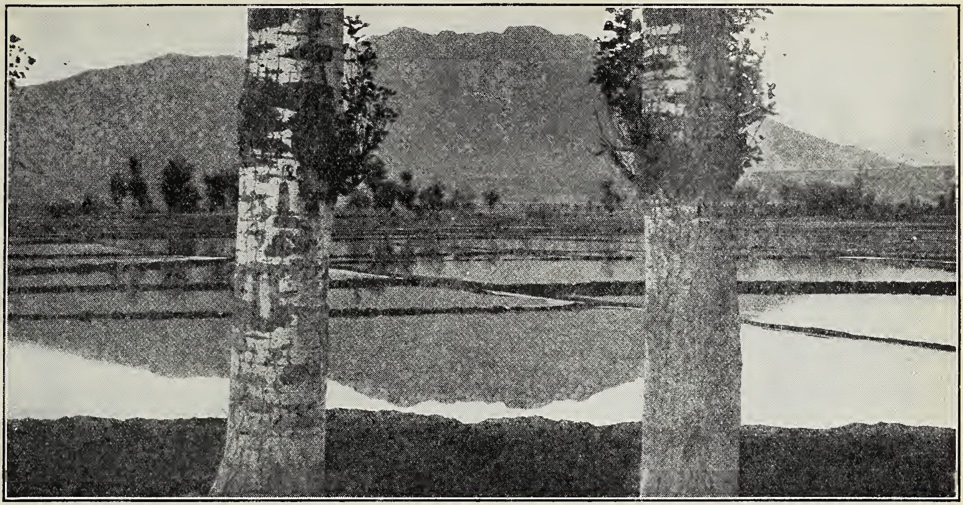


Fig. A. Flooded rice fields in the Indus Valley, India. The rice plants grow in the water. The mounds of earth hold the water on the fields.

THE DESERTS OF INDIA

In southern Asia there is a country called India. Our map on page 17 shows that in the northwest part of it near the Indus River there is much desert. This Indian desert is sometimes called the Thar Desert. Very few people live in the desert itself, but it has many large oases. These are along the banks of the river Indus and its branches. This river comes down from the mountains that are to the north of India. When the warm weather comes, the snow on the mountains melts just as it does in the western part of the United States. The rivers then run full of water, and the farmers on the banks use this water to irrigate their fields. That is why the oases of the Thar Desert have many people. When a desert has a river running into it, the oases can have rich farms.

THE AUSTRALIAN DESERT

Get your globe and find Australia. It is almost on the other side of the world from us. Australia also has much desert. The people of England and America are very fond of exploring strange places, but there are many parts of the Australian desert in which no white man has ever yet been. There is one part of it, though, that the white men know very well. That is a line across the middle of it from south to north. There is a telegraph line that crosses here. For a long time that telegraph line was the only way the people of Australia had of sending telegrams to India and other countries. This telegraph line is called an overland telegraph. It goes across the desert for hundreds of miles. It was hard work to put up this line. Far out into the desert they had to carry

Photo. by J. Russell Smith

Fig. A. A mud village in the drier part of India. There are thousands and thousands of villages like this. The man, the cow, and the calf are in the court-yard. The barn opens to the left side of the court. The house is at the right, with a grass awning over the door. Behind the cow a mud fence separates two yards or courts.

poles and wire and men and tents and food. How do you suppose they carried all these things out there? They sent to Arabia and got a ship-load of camels and brought them to Australia. Wherever there is a hot desert, there the camel feels at home. He is a child of the desert.

THINGS TO DO OR TO THINK ABOUT

1. When you were at the seashore, did you ever feel the hot sand on your bare feet in the middle of the day? How did it feel when you went back again about an hour after sunset? Imagine that you could try this experiment in the Sahara Desert. Which of the two would be colder at night, sea or Sahara? Why?

2. Read only the correct statements in the following sentences:

On the edge of the desert we find (very few) (many) streams to irrigate plants. So we find (many) (very few) plants.

That means (very little) (plenty of) food for people to eat.

Therefore (many) (very few) people live here.

3. What part of the United States has hot, dry lands as in Africa?

4. Copy and fill in these blanks so that the whole will make sense:

When we were at the seashore, we looked out over the ocean and saw waves of .... When we were at the edge of the desert, we looked over the desert and saw waves of .... These were called .... In the desert, we saw very few plants, except at places called ...., where there was a tiny stream or a spring. We saw .... rivers, except one large one called the .... River. But this river was just at the very .... edge of the Sahara Desert. We also found .... cities because .... We saw people traveling in tribes with a .... at the head of each tribe. Sometimes we saw several hundred people traveling together with their camels. Such a group of people we call a .... The Bedouins often travel in these large crowds to protect themselves from ....

5. Why do the Arabs enjoy story-telling and music better than playing lacrosse like the Indian fur trappers of Canada?

6. Study the globe carefully to find the Arabian Desert, the Syrian Desert, the Mongolian Desert. Does the tropic of Cancer run through any of them? Look at the northern part of the Mongolian Desert and then at Newfoundland and see if you can explain why the people in Mongolia require heavier winter clothes than the Arabs do. Find Palestine and China and add them to the list of *Countries That We Can Locate.* Find the Nile River and the Indus River and add them both to the list of *Rivers That We Can Locate.* Run your hand over Asia and Australia and add them to the list of *Continents That We Can Locate.* It happens that Australia is the only continent that is also a country. So add it to the list of *Countries That We Can Locate.*

7. Add the Nile River to the floor map and save this floor map for the next chapter.

8. How would you know the difference between an Arabian camel and a Mongolian camel?

Fig. A. "Father Nile" at high water. In the background of the picture may be seen three of the pyramids. The Pyramid of Cheops at the right is 451 feet high. Your teacher will tell you how high your school building is.

EGYPT—A DESERT MADE PRODUCTIVE BY A GREAT RIVER

"FATHER NILE"

An Experiment for the Class

Get a quart of good, clear building sand; put it in a washbasin; fill it with water; stir the water and the sand; and wash the sand. Do this several times until the sand will not make the water at all dirty. Put the sand into two flowerpots. Plant several kinds of seeds in each. Water one with clear water. To get water for the other, take a quart of the richest dirt you can find. Put it in a bucket with about a gallon of water; stir it up until it is muddy. Water the other pot of seeds with this muddy water. Keep it and use no other kind of water. Watch these plants grow for several weeks, and you will understand something about Egypt.

We learned in the last chapter about the Sahara, the great desert in **North Africa.** We also learned that one river, the Nile, flows through the eastern side of the desert. For a long, long way this river has no streams flowing into it because the country has no rain. On the upper part of its course many smaller rivers flow into the Nile.

Suppose we are traveling in the Sahara near the western bank of the Nile River. Suddenly we find ourselves upon the top of a hill. Behind us is the bare desert—not a blade of grass, not a bush, not a tree is to be seen in that direction. All is sand, dry dirt, and stones as bare as the pavement of a street. It is of a light yellowish color. The sun beats

upon it so fiercely that the glare hurts our eyes. In this hot place the air dances up and down as air shimmers over a hot stove.

Such is the desert upon which we stand, but what is this a little lower down in front of us? What is all this greenness lying right beside the desert? It is an oasis. The greatest oasis in the world. This is the Nile Valley, and it is so green, oh, so green, with fields of wheat and clover and many other crops. Why is Egypt so green? One word tells us. That word is Nile—the great river. "Father Nile," the Egyptians call it.

We have already found that a little stream of water in the desert makes an oasis. Here is a great stream of water flowing in the desert. This makes a great oasis.

The Nile brings water into Egypt from Abyssinia, a land far away to the south of the desert. This land has much rain, and the Nile very kindly carries the water down into the desert and makes Egypt. If the Nile should stop running, all this beautiful green valley would be a bare, hot desert; and where there is now a village with a thousand people, there would not be food for two grasshoppers.

The Nile is the kindest river in the world. It furnishes the water to irrigate an oasis, and then it very kindly does the irrigating for the people.

In June the river is low. Its banks stand high and dry. About the seventeenth of June comes what the people call "the night of the drop." They say that a magic drop has fallen into the river, for the water begins to rise. Day by day the water in the river gets deeper. It creeps higher and higher up the banks. For three months the river rises, and about the middle of September its banks are full. This is the great day for the farmers of Egypt. This is the day when the water flows over their fields. They have been working for weeks to get ready for it.

Each farmer has divided his land into little squares by making a low bank of earth around each square or basin. He has dug a ditch that goes from the river to one of the little squares. The river is now full of water. The water will flow from the river into the little ditches. Each farmer now takes his shovel and removes the little dam of earth built in the end of each of his ditches to keep the water from flowing in before he was ready for it. Now the water flows from a ditch to one of the little squares. It fills the little square. Quickly the farmer opens the next little dam, and the water flows to the second square, and so on, and on, and on across the flat land of the valley. As soon as one little square is full of water, the farmer shovels dirt back into the opening, thus turning the square into a little pond. In this way hundreds of farms are turned into many little ponds—thousands of farms, tens of

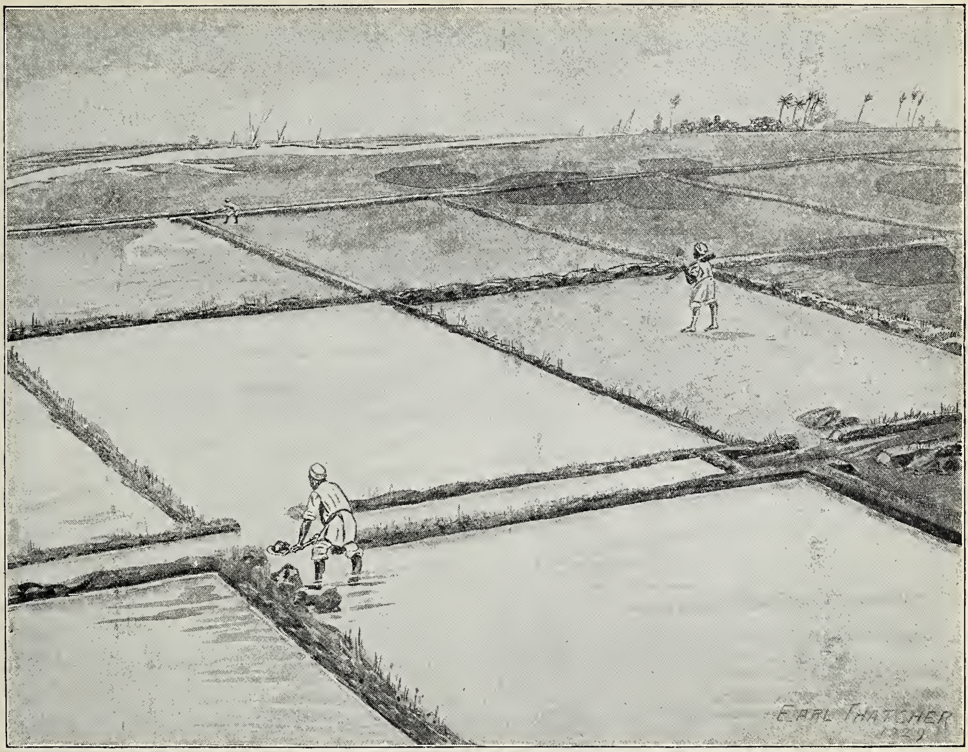


Fig. A. After you have read pages 96 and 97, tell what these farmers are doing.

thousands of farms—all turned into little ponds or basins, each basin filled with muddy water brought by the river Nile from the high, wet region of central Africa and Abyssinia.

Land in Egypt is so precious that the people do not waste any of it by putting up fences. It looks like one huge field. After the crops are cut, you can see little stones stuck in the ground to show where one man's land ends and another's begins.

Soon the water in the river begins to go down. The rainy season is over in the rain land far to the south of the desert. The water in the basins soaks into the ground, and the mud that is in the water stays on the earth. This mud is rich with plant food. It has plant food enough to feed a good crop. The farmers now take their seed wheat, their seed barley, their peas, and their beans and sow them in the mud of their little fields. They hitch the donkey or the ox or the cow to some bushy treetops, which they drag across the fields, stirring the seeds into the mud. That is all they have to do. The seeds sprout very quickly in the rich, warm mud. The sun shines without ceasing in November, December, January, and February on the earth

Fig. A. Threshing in Egypt. Read this page and then tell about the picture.

that has been soaked with enough water to make the crop.

In March and April comes the great harvest. Everyone helps with this work. Wheat and barley are cut with little knives held in the hands of the harvesters. The stalks of grain are tied into bundles by hand. The bundles are loaded into great nets of rope and carried away on the backs of donkeys and camels to the threshing floor.

The threshing floor is a piece of hard, bare ground. The sheaves of grain are spread upon it. Oxen or camels or donkeys are driven over the grain dragging something that looks a little like a sled. This crushes the straw and shakes out the grains. The people then pitch the straw to one side with forks. A pile of grain and chaff remains on the floor. This they throw up into the air with shovels when the wind is blowing. The wind blows the light chaff to one side, and the heavier grain falls straight down to the ground. Here is grain for enough bread to last until the next harvest.

Now do you see why these people call the river "Father Nile"? For thousands of years Egypt has been as it is now. Each year the Nile floods. It irrigates the fields; it fertilizes the fields. For thousands of years the people have raised good crops and have had enough to eat. They did this before there was any United States, before Columbus discovered America, before the time of Christ—long, long before the time of Christ.

In the little flood basins are grown wheat and barley for bread, peas, beans, onions, and other vegetables, and clover and vetches for the donkeys, oxen, and camels.

If the people want to grow crops during the time of low water, that is quite another matter. In some places the water can be carried from the river to the land in canals, but

in many places men have to lift it up from the banks of the stream. This is very hard work. The picture (Fig. 99-A) shows how they do it with a balanced pole called the *shaduf* (plural *shawadif*). It works exactly as did the well sweeps that were used on farms in America a hundred years ago to lift water from wells in farmyards. A lump of dried mud or a stone fastened to one end of the pole balances the bucket full of water on the other end of the pole. A man pulls the leather bucket down and dips it into the river, lifts it up, and pours the water into a pool behind him. If the bank is high, another shadufer lifts it up a second time and perhaps another does it the third time. Then the water runs out to the field. All day and all night the shaduf works for a hundred days in the season of low water to make the crops of cotton and corn and sugar cane and peanuts and rice, and to keep the gardens growing. Thus the people may have fresh vegetables all the year. The Egyptians are splendid gardeners. It is hard work to keep the shaduf going. The men sing and chant songs as they work. Here are two of their songs:

"Shawadif—
Their ropes are of palm fiber
And their pails are of goatskins,
And it was in ancient times that
shawadif were invented
By the blessed Salid Zabadi."

The second one speaks of the hard labor of working a shaduf:

Fig. A. These two Egyptian fellahin (page 101) are raising water from a well to their fields by the use of the shaduf.

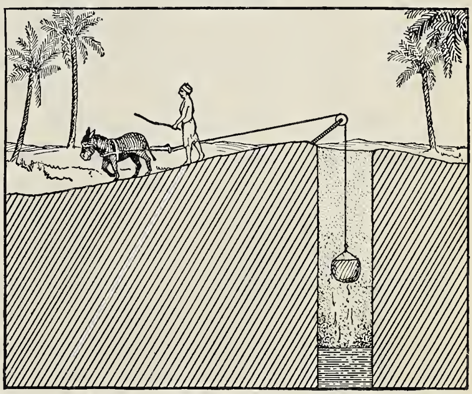


Fig. B. After you have read page 100, tell about this picture.

"Wilt thou strangle me, O God?
Loosen the noose!
No mother weeps, (for me)
No aunt,
No sister."

Fig. A. Plowing in Egypt. What kind of plow is being used? How do the cattle pull the plow? Do you think that the soil here is hard or easy to plow? Why do you think so?

Another way to get the water up on the land is to use a wheel (Fig. 99-B), in which the donkey or the ox does the hard work. This machine creaks and groans; so there are two water songs, the creaking of the water wheel and the singing of the men at the shaduf, all through the spring and summer season of low water.

When the Egyptian farmer plows his field, he uses a plow of wood with a bit of iron on the end. This kind of plow has been used there for thousands of years. It would not do good work in hard ground, but the Egyptian soil is soft and has no stones.

The Egyptian farmers live in villages, and most of the people of Egypt are farmers. What else could they do? No forests will grow on the land that is not irrigated, and what they irrigate they use for growing food crops or cotton; therefore the Egyptians cannot be lumbermen or woodcutters. There is not enough rain to make pasture on the land that is not irrigated, and they cannot keep large flocks. There are no mines of iron or copper for men to dig. There is no coal to run factories. There is only the rich soil and the river water, and the warm sun shining in the rainless sky. Therefore Egypt is a land of farmers. Every boy knows all about crops.

You can easily guess that when Egypt sends goods to other countries she sends farm crops. The people eat nearly everything they grow except cotton. They sell much cotton. It is the finest cotton in the world because the fibers are so long and so strong. You see some of it almost every day, for it is used in making automobile tires.

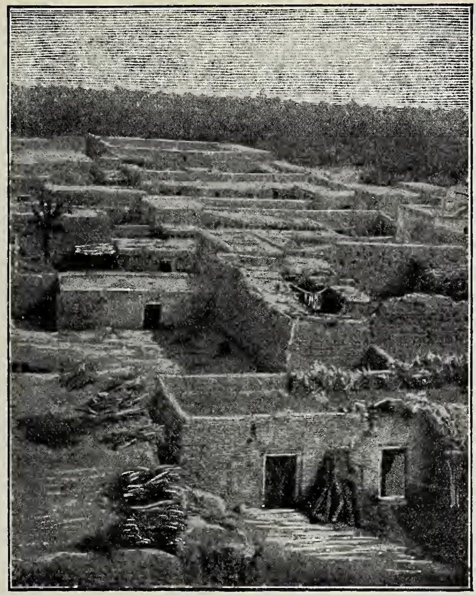


Fig. A. A rear view of the one-story houses of an oasis town. Palm trees are growing in the background. Why are the houses without shade? Can the people use the roofs as porches?

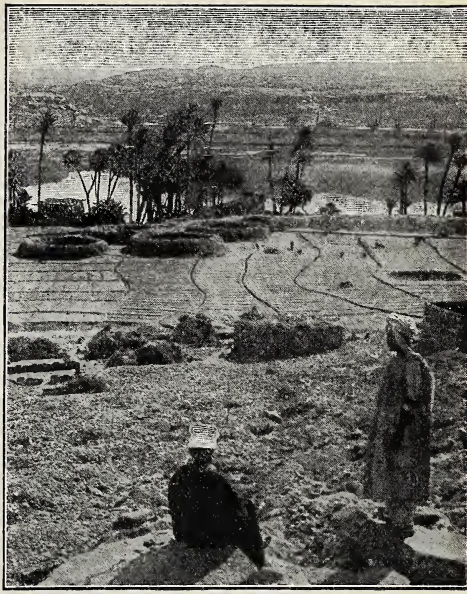


Fig. B. Stone circular threshing floors in the little fields beside the Nile. On the farther side of the river the stony desert is seen. What kind of trees do you see?

THINGS TO DO OR TO THINK ABOUT

1. Pretend that you are traveling up the Nile River toward Aswan, about three o'clock in the afternoon. Turn your face toward Aswan. Where is the sun? Is your shadow longer or shorter than it was in Eskimo Land?
2. We are back in our own school. Point to Egypt. Would our shadows be longer here or in Egypt?
3. Make a model that will show how the Nile River irrigates the farms for the people of Egypt.
4. Explain, with a model or a drawing, how the people in the Nile River Valley irrigate their farms during low water.
5. There are three good reasons why the Egyptian people can make a living best by farming, and there are four very good reasons why it would be very hard for them to do other things. Try to think of all these seven reasons.
6. Write a sentence about each of the pictures in this section.

THE PEOPLE OF EGYPT

Most of the people of Egypt are called by the name *fellah* (plural *fellahin*). It is an Arab word meaning "one who digs or tills." They are big, strong, good-natured, dark-skinned people. They love a joke, even if the joke is on themselves.

You might call Egypt the land of mud. Nile mud makes the fields rich. Mud is used to make bricks of which the houses are made.

When a fellah wants a house, he takes some mud or clay and packs it into a little wooden box. The mud takes the shape of the box. Then he turns it out on the ground to dry in the sun. This is a sun-dried brick. He builds the walls of

his house of sun-dried bricks, which he sticks together with soft mud. Perhaps he will plaster the outside of his house with more soft mud.

When his little home is ready for its roof, he puts two or three palm logs across the top of the wall, and on the top of the logs he lays many long palm leaves. A palm leaf is longer than a man. Its central rib is as strong as a broomstick. The leaflets are also tough, almost like reeds. Thus a layer of palm leaves across the palm logs is a good support for the mud roof. The mud roof is almost the most important part of the one-story, one-room house. A wall is built around the roof to a height of two or three feet (Fig. 101-A). Thus the roof becomes a kind of porch where the family can sit after sunset and watch the people come and go in the narrow village street. The roof serves as a cat run, as a dog run, and as a drying place. Bundles of sticks or bundles of cornstalks for the family stove are often stored on the roof. There too is the granary that holds the family grain. It may be kept in a tough, strong basket made of palm ribs, or in pots made of clay. Here also may be some chicken coops or some pigeon houses made of mud. The Egyptians are very fond of pigeons. In fact, the house roof is really a combined porch and back yard. A house usually has a yard where the donkey and the goat or the cow stay at night.

It is never very cold in Egypt; so many of the houses have only a curtain instead of glass windows. Sometimes there is no door; only a curtain of homemade rush matting hangs in the doorway. Flies buzz in and out by the thousand.

Any Egyptian can make a mud stove in ten minutes. Here the cornstalk fire will boil a pot of water. He can even make a little mud stove on which to bake his cakes. When he once gets it hot, he bakes enough thin cakes to last for a week or two. The rich people eat wheat bread and the poorer people eat corn bread.

What do you think would happen to this mud house if a heavy rain came? It would settle down into nothing but a pile of dirt and logs. I have seen some of them after a flood. They certainly are a mess. One of the great dangers of the Egyptian village is that water at time of flood may rise high enough to reach the houses. The land is so level that most of it is covered by the flood. Here and there are places a foot or two higher than the rest. Here are the villages. If the water happens to rise high enough to touch only the bottom of the wall, it will settle down like lumps of sugar in a cup of coffee. After this has happened, you may see the poor fellah digging in the mud to pull out some of his possessions that are buried under the mass of stuff that makes the roof. I saw a man working hard in such a place, pushing away the mud and pulling out palm leaves.

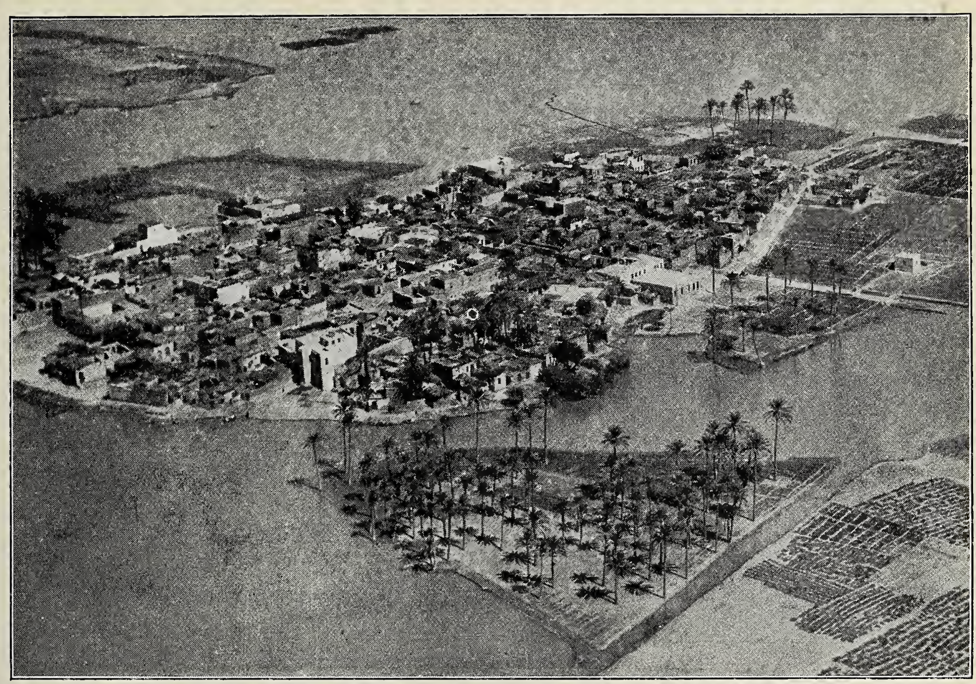


Fig. A. This is the village of Mena in Egypt. At low water it is on a part of the mainland. When "Father Nile" is in flood, however, the land on which the village is built becomes an island. See the date-palm trees; the crossbars of irrigated fields; the flat-roofed houses.

Finally he got out a goatskin full of butter. He put it on his shoulder and carried it to the house of a friend.

In flood time the village is an island of dry land in a sea or lake of water. As the village is nearly always shaded with date-palm trees, it is also an island of trees in a sea of fields. With the flood comes a plague of mice. They go scampering into the villages to keep from being drowned in the fields. Do you think the cats like the flood?

Under the palms of the village we may see a weaver with his strings tied to two palm trees while he works back and forth weaving some homespun cloth. At another place we may see the potter and his wife. She treads the clay with her bare feet to give it a smooth, even quality. He shapes the clay into pots ready to be burned in a clay oven and afterwards sold in the market.

The market place in an Egyptian village is a wide open space of hard, bare ground shaded by palm trees. The market is really the village store. It begins at dawn, for that is the cool time of the day.

In the market you will find dozens of people squatting on the ground waiting for buyers. They have little

Fig. A. A market scene near the pyramids in Egypt.

piles of things on the ground in front of them. Some have onions or tomatoes. Others have little heaps of garlic, sacks of wheat, baskets of beans, loaves of bread. Others have bundles of sugar cane just ready to eat. This is the Egyptian stick of candy. The children love to chew it and suck the sweet juice.

One section of the market place is the sheep market, another the goat market, another the camel market, another the donkey market. Over at the meat market the butcher has a carcass of sheep or beef hung up. He killed it an hour ago. You may pick out the piece you want, and he will cut it off for you. Another section of the market has women with pails of cheese and butter that they have carried in on their heads.

The tinsmith is busy cutting up kerosene-oil cans that came from Philadelphia. While you wait he will make for you a mug or a lamp or some other tin thing. The shoemaker sits at the edge of the market making shoes, and he has some to sell. The fortune teller is there; so is the tattooer; and also the water carrier offering you a drink of Nile water. There is much talk and no hurry. If a woman expects to get three cents for the onions, she will ask you six, and you will spend five or ten minutes in making a bargain. Egyptian merchants do not

like to sell their things for a fixed price. They much prefer a long talk and a bargain. The village market is indeed a most interesting place to buy or sell, see your friends, and get the news. There are village markets in many parts of Asia and Africa and in some parts of Europe.

Every village has two things—the market and the mosque. Mosque is the name of a church building of the people of the Mohammedan religion. Every mosque has a tower called a minaret. Five times each day the priest climbs to the top of the minaret and cries out in a loud voice telling people to say their prayers to Allah, the Mohammedan name for God.

This great oasis, the Nile Valley, reaches from Aswan to the Mediterranean (Fig. 77-A). In all that distance of four hundred and seventy-five miles, boats can run up and down the Nile River. Everywhere it has the same flood that we have been talking about, the same farms, the same shawadif, the same villages with their mud houses, their markets, and their mosques.

THINGS TO DO OR TO THINK ABOUT

1. You have seen a small stream. Usually it flows quietly along. Once in a while, though, it overflows. What makes it overflow? Think hard and tell us why the Nile River overflows every year.

2. Copy and fill in the blanks:

A little stream in the desert turns the land near it into an ...., which means a fertile spot in the desert. The Nile River turns Egypt into the largest .... in the world. That is why .... people can live in Egypt. Then, too, they do not have to be .... like the Bedouins in the Sahara Desert, but can live in one place all the year around. When the Nile overflows and goes down again, it leaves a layer of earth that is full of plant .... Just because the plants can find good .... in this new layer of earth, they can grow well. When the crops are ripe, the Egyptian people can use them as .... for themselves and their animals. That is why the fellahin of Egypt can have animals like the .... and the ...., which the Bedouins cannot keep. Some of the crops that the fellahin raise are ...., ..., and .... These are all used to feed either themselves or their animals. However, there is one crop that neither the men nor the animals can eat, but which is very important because they can sell it to people from other lands. This crop is .... It is .... very cold in Egypt. We know that this is so because the people can have .... to eat all year and because the houses often have .... instead of windows and doors. The mice do not like the flood because it may .... them. The cats like the flood because it brings them many .... If the flood runs into a mud house, the house ....

3. Try to make a model of a shaduf for the school museum, and be sure to look for a real one on your next trip to the town or the state museum.

4. On the blackboard, write the names of the twelve months of the year. Then, alongside of each month, write a few words about the Nile River and farming in Egypt for that month. Think carefully what you are writing and be sure that what you write is really true for the month about which you are writing.

5. Tell five or six ways in which the Nile River has something to do with the kind of houses in Egypt.

6. What did the Eskimos use for fuel? What do the Egyptians use?

7. Suppose you were up in an airplane, looking down on an Egyptian village during a flood. Tell what you would see.

8. Make a drawing of an Egyptian house roof at sunset.

Fig. A. A relief map of Switzerland. Find Switzerland on Figures 110-A and 112-B. Pages 109 and 112 contain a very good description of this map. Find on the map each place mentioned in the text.

Fig. A. The tall mountain which you see in the picture is the Matterhorn. It is one of the most beautiful of the Swiss mountains. Down in the valley is the Swiss town of Zermatt. People like to visit Zermatt for winter sports. See Figures 127-A, 128-A, and 129-A.

LIFE IN MOUNTAINS— THE SWISS

No

GOING TO SWITZERLAND

This will be a trip to a land of many, many interesting and beautiful scenes. As we travel, we shall stop at five or six places and sketch pictures to take home with us. Be sure to name every picture. Perhaps we shall color some of the pictures. Maybe when they are finished, we shall collect all the pictures into a booklet. What title should we give the booklet?

We can go all the way from New York to Switzerland by boat. In about eight days a fine, big passenger steamer will carry us from New York to Rotterdam, a city on the river Rhine near its mouth. How different is the Rhine River from the Amazon River! The Rhine, like the Amazon, has low islands made of the mud that the river has brought down; but it is very unlike the Amazon, because these islands at the mouth of the Rhine have all been made into farms. We shall study about them in another chapter that tells about Holland.

At Rotterdam we can change from our ocean steamer to a river steamboat, a Rhine steamer. For several days the river boat takes us upstream. Here there is not much to

Fig. A. This is a relief map of Europe. It shows the kinds of surface which the continent has.

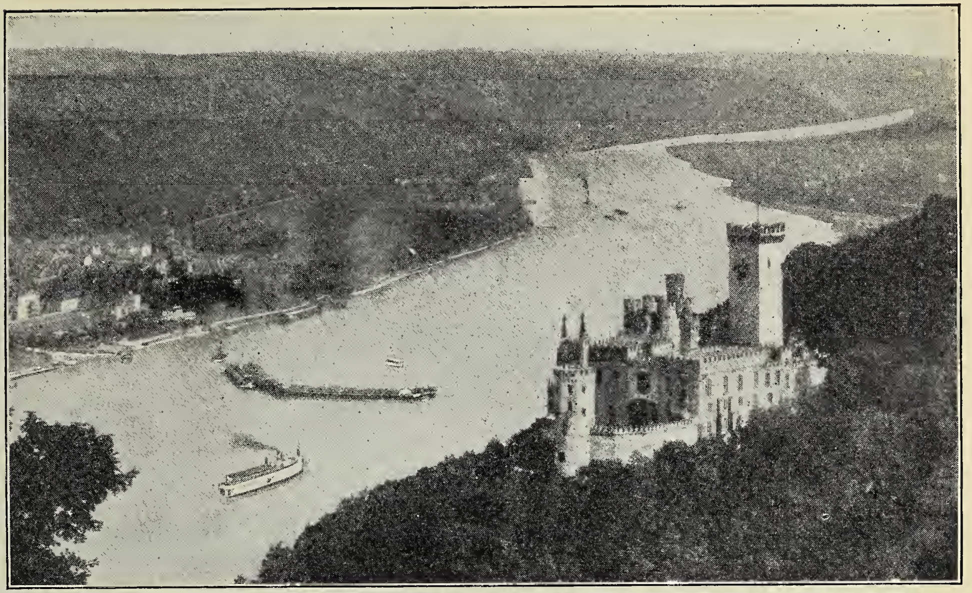


Fig. A. On our journey to Switzerland, we sailed up the Rhine River. We saw many old castles built on top of the high river banks. The castle in the picture is Burg Stolzenfels (Proud Rock Castle).

make us think of the Amazon. We never pass a big forest. There was once a forest here, but it was cut down, and the land was made into fields and little farms. We see villages. We pass cities where there are many factories with tall smokestacks. We see railroad trains with locomotives puffing and whistling along the shore of the river. Everywhere we see signs of many people, many cities, towns, villages, and little farms. We are in Europe. Europe is more like our own country than any place we have visited. The chief difference between Europe and our country is that there are so many people in Europe that they have to use their land very carefully in order to grow enough crops for all the people. In the United States we have so much land that we do not yet take good care of all of it.

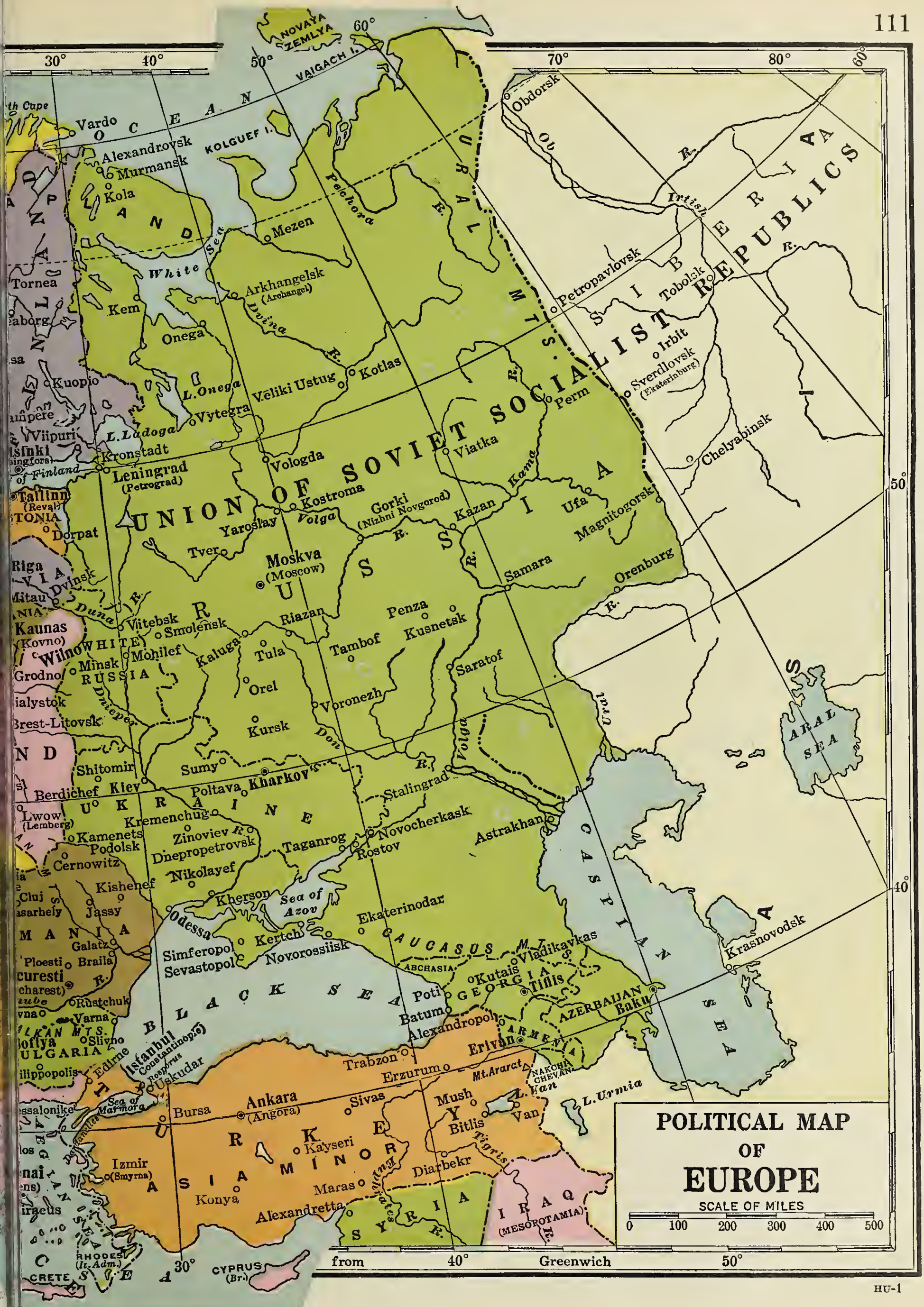
As we go up the Rhine, we pass many interesting things; but we shall read about that in another geography year after next. At last the mountains come close to the river, and we stop at a city called Basel. Basel is on the edge of Switzerland. Switzerland is an interesting and beautiful country. Thousands of Americans go to Switzerland every year because it is such a nice country in which to travel and enjoy a vacation.

If you look at the map of Switzerland (Fig. 106-A), you will see that it has mountains in the north and many wide mountains in the south. The land between these mountains is lower than the mountains, but it is higher than the Amazon Valley.

Spellings of place names are in accord with the most recent decisions of the United States Geographic Board.

HU-1

Fig. A. This map is a political map.



It shows the different countries of Europe.

Fig. A. On this globe our steamer route from New York City to Rotterdam has been drawn.

Fig. B. This map shows a part of Europe. The black area shows the position of Switzerland in Europe. Run your finger up the Rhine River to Switzerland. The dash lines represent canals.

It is called a plateau. Most high plains are called plateaus. This plateau of Switzerland has many lakes on it. One large lake at the southwest is called Lake Geneva, and another large lake at the northeast is called Lake Constance. If you look closely at the map, you will see that two rivers come out of the high mountains of Switzerland and flow into these lakes. The one that flows into Lake Constance is the Rhine. It goes on down to the North Sea. The other that flows into Lake Geneva goes down to the Mediterranean Sea. Can you find its name on the map (Fig. 110-A)?

The map (Fig. 110-A) shows you that Switzerland seems to be a country from which rivers run in all directions. We have seen the two rivers run off in two directions. If we look closely, we see that the branches of the Danube run off to the east and the branches of the Po run away to the south. These four rivers show us that the mountains in and near Switzerland divide the water so that it runs away in many directions. Switzerland is the top of western Europe. The most interesting thing about it is its high mountains, the Alps.

THINGS TO DO OR TO THINK ABOUT

1. Make a floor map of Switzerland. Then show the land around it as far north as the North Sea and as far south as the Mediterranean Sea. Show the location of the four rivers, the two cities, the two lakes, and the two seas that we have just visited. Add all the new names of places to your location lists. But first be absolutely sure that you can really locate all these places.

2. Make sand-pan models to show the difference between a mountain, a plain, and a plateau.

3. Add the Switzerland trip to the *Trips That We Are Taking.*

4. Where else on our travels have we found a land that divides the waters of two or more rivers? What did we call it on account of this? What then might we call Switzerland?

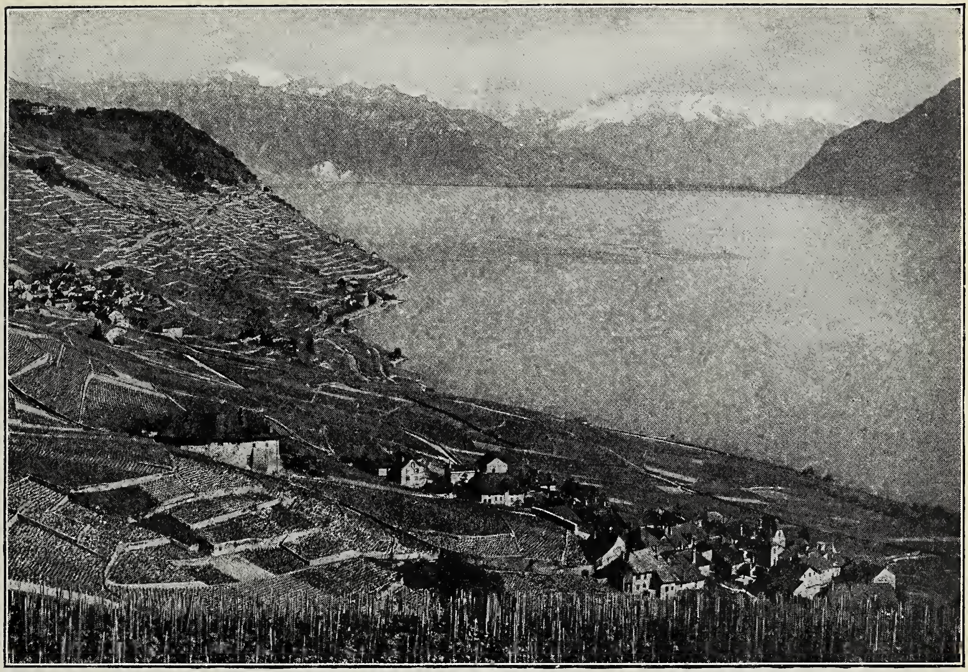


Fig. A. The body of water is Lake Geneva in Switzerland. The snow-clad mountains are the Alps. The steep hillsides have been terraced and planted in vineyards.

THE HIGH MOUNTAINS

Before reading this section try to find how high your schoolhouse is. Perhaps your teacher will help you to find how many such buildings, one on top of another, would be a thousand feet high.

Travelers who have crossed the United States on the Lincoln Highway or some other highway, tell us that the weather is much cooler in the mountains than on the plains. It is always that way in the mountains. The higher up we go, the cooler it gets. There are two ways to get to cool places. One is to go to the Far North or to the Far South; the other is to go up a mountain or up in an airplane.

One of the travelers who came with us on our boat from America wants to climb a high mountain. He wants to go to the very top or peak. Let us go with him as far as we can. As we stand here on the central plateau of Switzerland looking toward the south, we see tall mountains. The tops of the mountains are covered with snow, winter and summer.

We get into an automobile and go south across the plateau toward the shining white mountains. The plateau is a land of farms, all well kept and very neat. Every bit of good land is made into fields with

Fig. A. This picture shows a section of the famous St. Gothard Pass in Switzerland. The road winds round and round as it climbs the mountain, in order to avoid steep grades.

orchards of apple trees and plum trees and walnut trees along the road. Here and there on a hillside that slopes toward the south, we see many grapevines.

As we go up the good road and reach a height, or altitude, of two thousand feet above the level of the sea, we leave the grapevines; but we keep on passing the hay fields, the wheat fields, and the oak trees until we come to three thousand feet above the sea. At three thousand feet we leave the oak trees. Our road now enters a valley, for we are getting into the Alps. We see high, rocky hills on each side of the valley. Nearer to us are little fields and small villages of a few stone houses. As we climb up and up the valley, we meet a stream coming swiftly down the mountain. It flashes white in waterfalls as it jumps over the rocks on its way down to the lakes on the plateau.

Between three thousand and five

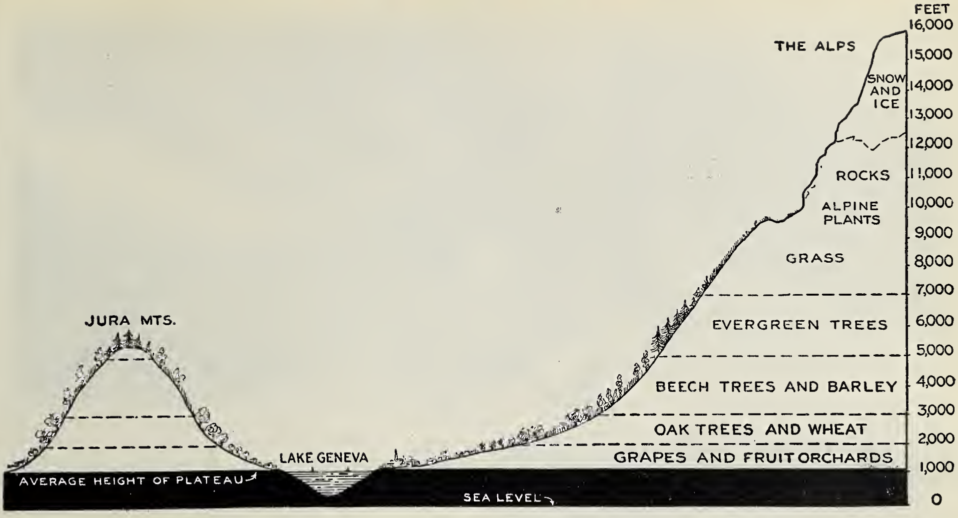


Fig. A. After you have read pages 114 and 115, tell about this picture.

thousand feet above sea level the fields have barley in place of wheat, and the trees are the white-barked beeches instead of the oak. At five thousand feet the barley fields stop and the beech trees stop. Instead, we see evergreen trees, pines, and firs. On up we go along the good road that the Swiss have worked so hard to make. In and out the road bends, and back and forth it goes so that it may not be too steep. We look up at the forest of evergreens, and we see a long strip where there are no trees, only bare earth and stones. A great pile of earth and stones lies at the foot of a hill. It tells us that here was a landslide. In the spring of the year, during heavy rains, a large amount of rocks and dirt slipped loose from the mountain side and crashed down through the forest, sweeping everything in front of it and leaving a bare place behind it.

At seven thousand feet we pass the last evergreens. We have come to what is called the tree line. Above this it is too cold and windy for trees. The last trees we see look as though someone had been sitting on them nearly all their lives, and indeed that is the case. The little trees that look as though someone had sat upon them have spent their winters under heavy snow, and in the summer the wind has blown so hard that they could not hold their tops up. Trees that try to grow in such places have to bend to the wind and so grow crooked. A tree may be no higher than your knee, but as old as the big trees down on the plateau or as old as the trees along the streets and yards near your home.

Our automobile goes on up for half an hour. We are beyond trees, but not beyond plants. Indeed, this

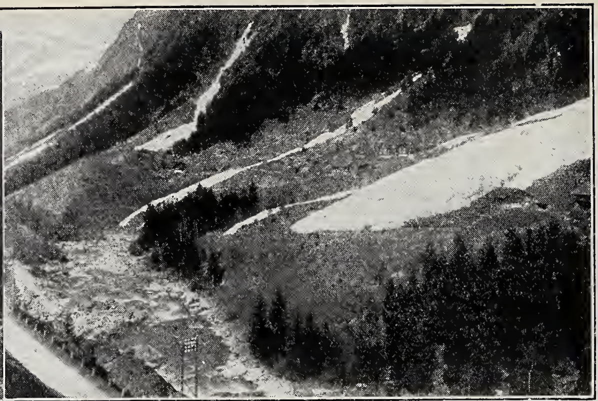


Fig. A. The smaller picture shows an avalanche which has just torn its way down the Swiss mountain side into the valley. The big pile of snow makes the men seem very tiny. In the larger picture you can count the paths of at least four avalanches. Each path is shown by a patch of bare earth and, higher up, a snow pocket.

is a very beautiful place, because the Alps, like most other high mountains, have many beautiful flowers that bloom above the tree line. This place is much like the tundra. You remember that when we went to Eskimo Land we went so far north that we got beyond the tree line and found the tundra full of flowers. Here on the mountains in Switzerland we are above the tree line, and we find that this place, too, is full of flowers. One of these, a red plant, is called the *Alpine rose*. The Swiss think it is a sign of youth and life. Another plant called *edelweiss* grows only in the rockiest places. It is a silvery white.

Suddenly the road, which has been going up, up, up for miles and miles, now goes down in front of us. We have come to the top, but we see many higher mountains to the right and to the left. The low place between these high mountains is called a pass. The road goes through the pass and down the other side of the mountain.

When we reach the pass, our mountain climber with his two companions leaves the automobile. The two men are Swiss guides. It is their business to help mountain climbers from foreign countries to climb the high peaks. We go with them a little way, for we see some snow, and we want to know what snow is like in July. When we get to it, we find a big drift of dirty, whitish snow. Beyond it and above it there are some bare rocks and then more snow, and up as far as we can see are snow and rocks.

Why is snow here in summer? The winter storms bring snow and more and more snow. It is piled so high that it cannot all melt during the short summer of the high, cool mountain. Each year adds to the pile of snow. Sometimes it gets to

be forty or fifty feet deep on the mountain and slowly works its way down the steep slopes.

You remember that when we went to Eskimo Land we read about the glaciers in Greenland. Switzerland also has glaciers, but they are not nearly so large as those of Greenland. Switzerland has one glacier that is twelve miles long. The snow on the high mountains slowly works its way down the steep slopes into the little valleys. Sometimes a valley that is much deeper than a house will be full of snow. The snow melts a little by day and freezes by night, and finally turns to solid ice. It fills the little valley full of ice, with a crust of snow on the top. This is a glacier. We may call this valley full of ice a valley with a stream of ice in the bottom of it. Slowly this stream of ice flows down the valley, a few inches or a few feet or a few yards each day. If the stream of ice comes to rough stones or boulders that lie in the bottom of the valley, it may crack open at the top in trying to get over the stones. Such a crack is a dangerous place. You may fall into a crack and be killed. People are killed on the Swiss glaciers nearly every year.

Fig. A. After you have read page 115, tell what has happened to this tree.

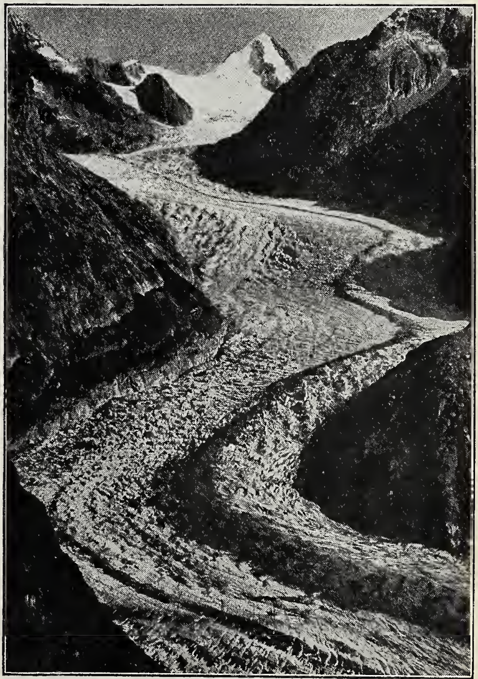


Fig. B. A glacier in a Swiss mountain valley. The glacier is fed from the snow field at the top of the picture. Trace with your finger the central moraine.

Rocks and dirt fall down from the steep mountain sides, rest on top of the glaciers, and ride down the valleys with them. Sometimes two glaciers come together as two streams do. Then the streams of rocks and dirt that were along the edges of the two glaciers come to the middle of the glacier. This string of rocks is called a *central moraine*. As the glacier pushes along down the valley, it freezes around rocks, clasps them

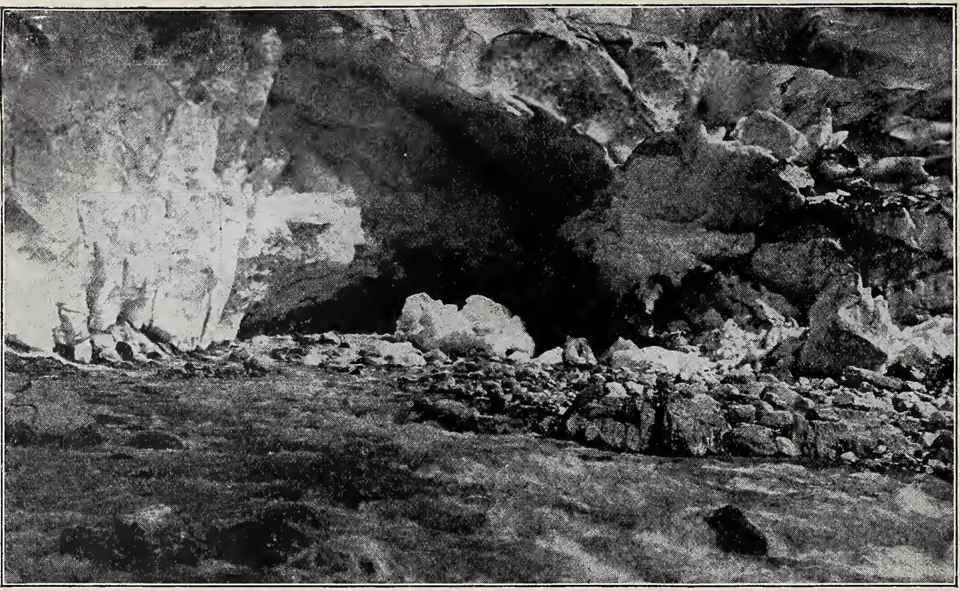


Fig. A. Your teacher will show you how to find the Rhone River on Figure 106-A. In the picture you see the stream which pours from the end of the Rhone glacier in Switzerland. This stream is the beginning of the Rhone River. Find the Rhone River on Figure 110-A also.

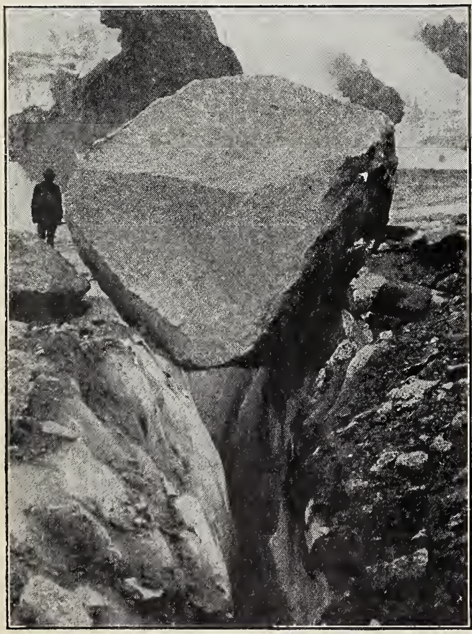


Fig. B. The guide is standing on the Aletsch glacier in Switzerland. See the big crack in the ice. How did the boulder get on top of the glacier?

tight in its icy mass, and then pushes them forward, just as you might take a sharp stone in your hand and push it around on a table. You would scratch the table in doing this; and in the same way the glacier pushing the stones scratches the valley and digs into the earth. For that reason, valleys that have had glaciers in them often are wide and round, because the glacier has shaped them that way. They are not sharp and narrow like the mountain valleys which are made by streams of water.

Finally, as the glacier goes downstream, it gets to lower and lower valleys where the heat of summer is greater. At last it comes to a place

where the ice melts as fast as the glacier brings it down. This is the end of the glacier, and here the glacier dumps off the rocks and dirt almost as a truck would dump them. Often it builds up great piles of them. This pile of stones that the glacier brings down is called the end moraine or *terminal moraine.* The Swiss valleys have many terminal moraines, and they are also to be found in many other parts of the world. Often the terminal moraine makes a dam across the valley. Water stands behind this dam and makes a lake. In that way most of the Swiss lakes were made.

While we have been looking down into the valleys at the glaciers, the American who wants to climb the mountain has gone up over the snow with his two guides. Each of the men carries a stout cane called an *alpenstock.* It has a sharp piece of iron on one end. He sticks this into the ground. On the other end of the alpenstock he has a little ax and a little hoe. He uses the hoe to dig out steps in the mountain side and the ax to cut steps in the ice.

To climb a high mountain made of bare rock and covered in places with snow and ice is a very hard thing to do. When they get to the worst places, the two guides tie a rope from their belts to the belt of the climber, so that if one of them should slip, the other two may hold him.

It is a great thrill to climb a high, snow-clad mountain. People go to Switzerland from the United States and many other countries just to climb these mountains. There are many men in Switzerland whose business it is to help the travelers make these dangerous trips. On many of the mountains there are little huts far up on the mountain side. Here the climbers sleep on the way up. Then they sometimes get up before daylight and start on the last part of the journey. Sometimes the snow is deep and the climbers must get over it and reach the top before the snow gets soft. If it does, it makes the walking very hard indeed. Sometimes, if the snow is soft, it slides down with the climbers. Many have died this way.

THINGS TO DO OR TO THINK ABOUT

1. Add the Alps Mountains to the floor map. To what else shall we add the name Alps Mountains?

2. Make some drawings that will help to explain these things:

   (*a*) The central and the terminal moraines of glaciers.

   (*b*) How a mountain pass looks and how it helps travelers.

   (*c*) How the side of a mountain looks with its different kinds of plants at different altitudes. What does the word *altitude* mean?

3. Make a sand-pan model of a dam. Show also how a dam made by a terminal moraine can cause a lake.

4. What kinds of trees do we find along the roads in our neighborhood? What kinds of trees do the Swiss people plant along their roads? Why do you suppose they do that? Which is better, their way or our way? Why do you think so?

5. Try to find pictures of an Alpine rose and of an edelweiss.

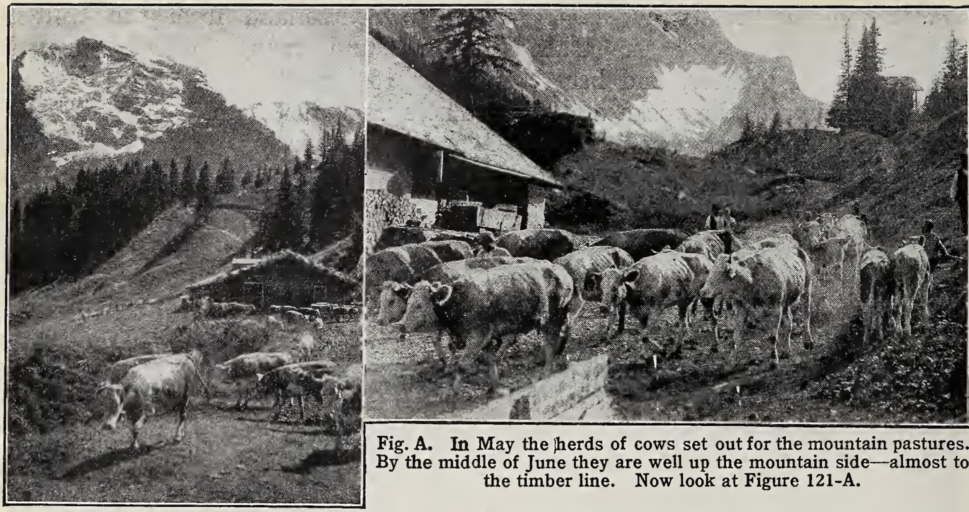


Fig. A. In May the herds of cows set out for the mountain pastures. By the middle of June they are well up the mountain side—almost to the timber line. Now look at Figure 121-A.

THE SWISS MOUNTAIN FARMER

Adolph Schneider is a farmer. He lives in a village in a little valley at the foot of the high Alps. When spring comes, he is very busy plowing his ground and planting his garden and his field of potatoes. He must get these jobs done before it is time to take the cows to the mountain pasture for the summer. This happens every year in May, when the snow has melted from the lower slopes of the mountain above the village.

The farmers of this valley do not have land enough near the village for the wheat field, the potato field, the garden, the orchard, the hay field, and also for pasture. The cows spend the summer on the mountain pastures where the land is too steep to be farmed. Everyone is greatly excited on the day the cows set out for the pasture. There are a hundred cows to go from this village. Five men of the village go with them to take care of them. Everyone in the village goes the first mile with the herdsmen and the cows. Every cow has a bell, and the leading cow of every man's herd has a bigger bell. The bells tinkle, and the people sing songs and play music as they go along with the herdsmen. This is a stanza from one of their songs:

"No life like the herdsman's, so lusty and fair,
Breathing and joying the sweet mountain air:
With the sun in the morning he rises and swells
With joy as he hears the gentle cow bells."

Adolph Schneider has only four cows of his own, but he will take care of twenty cows because he has the herds of three of his neighbors. In return for his care of their cows,

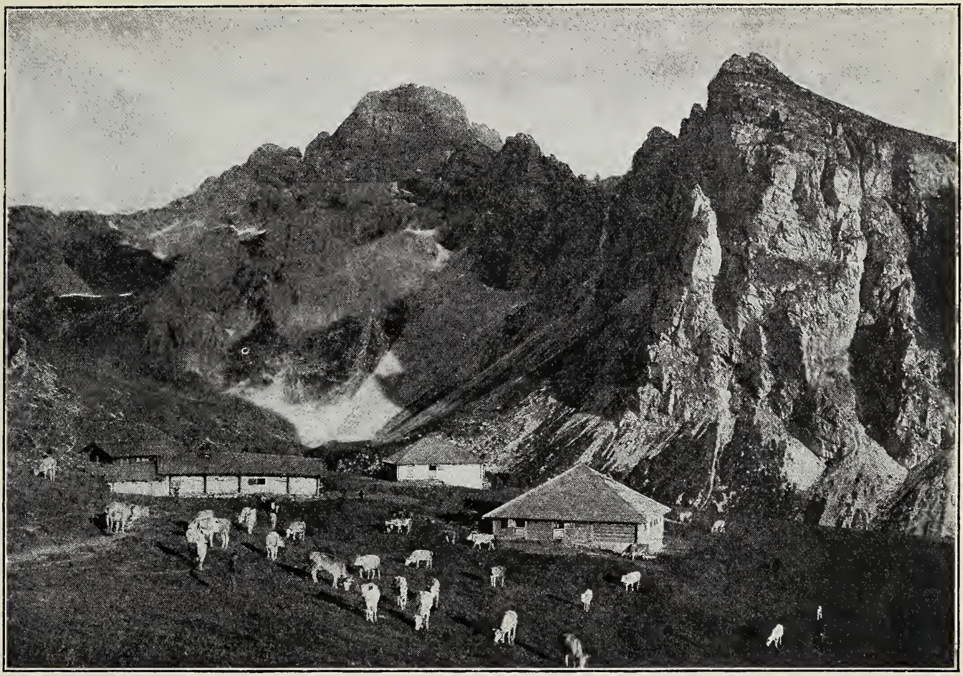


Fig. A. It is midsummer. The cattle are above the timber line. They are grazing on an alp. An alp is a high mountain pasture in Switzerland.

they will help with the work on his place while he is absent.

For the first two or three weeks the herd is only about a mile or two from the village, and some of the men come back every night; but by the middle of June the cows will have eaten all of the grass and must be taken farther up the mountain. By midsummer the snow has melted farther up, and there is fresh grass up there. All the men now live in a room at one end of a log shed, which is big enough to hold the cows at night. It is only a rude house. It has a rough table and rough benches. Sometimes the men sleep on hay spread on the benches. For food they have chiefly milk and cheese, and bread which one of their neighbors brings each week from the village.

Soon they move on. They move again and yet again. The last move is made in July. This time they are above the timber line, and they live in a stone hut. Here the work is harder because the men must carry wood up from the forests below. Wood is needed to heat the milk in the great caldrons where they make cheese. Every day each man milks his sixteen cows and makes the milk into cheese. Cheese can be kept for winter and sold in the city markets.

In August the nights are getting

Fig. A. An air view of a Swiss lake in the Alps Mountains during the wintertime. The lake is in a narrow valley which a glacier has dammed by pushing dirt into it.

shorter and colder and the cows have eaten all the grass on the upper pasture. The herders now bring them back to the lower pastures, where they eat what is called the aftergrass. Finally, in October, they get back to the village. Soon the snow comes. The cattle must now be fed in the barns until spring. There are stacks of hay waiting for them. This summer trip of the herdsmen to the mountains is called a *seasonal migration.*

While Adolph Schneider was on the hills taking care of his own cows and those of the neighbors, his wife and Kurt, his fourteen-year-old boy, and Kurt's little brother and sister all worked early and late pulling weeds, hoeing, plowing, and helping to harvest the hay. The neighbors whose cows Adolph keeps also help with the hay. Maria, Kurt's seventeen-year-old sister, went away for most of the summer to work in a hotel where many Americans came to stay a few days as a part of their European trip.

As soon as Mr. Schneider came back from the mountains, he spent two busy weeks digging potatoes, planting the wheat, and picking the apples. Mrs. Schneider dried some of the apples over the kitchen stove to make them keep until next winter and spring.

By November the ground was covered with snow. Kurt and the younger children went to school. Now Mr. Schneider and his neigh-

bors went up into the forest far above the village. They cut down trees and dragged them through the snow to the village. When spring came, they all had neat piles of firewood piled up by their houses, to keep the fires running for another year.

While they were working in the timber, they had to be very careful where they went because of the danger of avalanches. The snow gets so deep on the steep sides of the Alps that it often slides down. It sometimes catches people and buries them alive. In some villages the people do not dare to go away from the village for weeks, many long weeks during the winter, because there is danger of avalanches at that time. The villages, of course, are built in places where avalanches never come.

After the year's wood supply was in, Mr. Schneider spent several hours each day carving wooden toys to send to America. This was something he could do in the house. By carving toys he could make a little piece of wood give him a job for several hours. The Swiss must do everything they can to make a living in a country where there are so many people that no one can have a large farm.

THINGS TO DO OR TO THINK ABOUT

1. Here is a new kind of interesting chart to make. At the top of a very large piece of cardboard print, *How the People of Switzerland and the Rest of the World Help One Another*. Then draw a vertical line from the title to the lower edge of the cardboard. This will give you two columns. At the top of the first column, print, *What Other People Send to Switzerland*. At the top of the second column, print, *What the Swiss People Send to Other Lands*. Try to find a sample of everything that ought to go on this chart. Paste each sample neatly in the correct column. Be sure to label each sample. If there happens to be something for which you can't find a sample, make a drawing of it instead, and label the drawing.

2. Would you say that the Swiss people are nomads or not? Why?

3. Why do you think the Swiss farmers eat more cheese and less meat than farmers do in the United States?

4. Switzerland is a long way from Greenland. Why are there glaciers in both places? Which has the larger glaciers? Why is this so?

5. Tell something about avalanches.

6. Pretend that you are far, far up in an airplane, and have very, very strong field glasses. With them you can see the ground all the way from the equator to the north pole. Make a drawing to show how the earth looks with its different kinds of plants at different distances away from the equator. Look at the sketch that you have just made and then look at the drawing you made the other day about the side of the mountain. How are the two drawings alike? How are they different? Why is this true?

7. Copy the sentences and fill in the blanks:

Suppose we start at the equator and travel toward the north. The farther away from the equator we go, the .... it gets. Now go back and start at the equator again and travel toward the south. The farther away from the equator we go, the .... it gets. Now we are going to climb a mountain. The higher we climb the .... it gets. Thus we can see that two general directions have something to do with how hot or how cold a place is:

A. Distances away from the equator.
B. Distances up from sea level.

Fig. A. The Swiss have plenty of *white coal.* Water tumbling down the mountain sides is caught by dams like the one in the picture. Some of the water is led by pipes from the dam to the power house in the valley. The force of the falling water is used to make electricity. The electricity is carried to the cities over the power lines which you see in the picture.

CITIES, WATER POWER, AND TRADE

Mr. Schneider has two boys. What will they do when they grow up? Can he divide the farm into two farms and make a farm for each of the boys? No, the farm is too small. Only by hard work can it be made to provide enough for one family. One of the boys will have to get another job. What is there in Switzerland to give people work to do? Switzerland is a little country, and there is not room for any more farms or any more forests or any more cows. Therefore one of the boys must do factory work or other work in town. In town he will work for wages and buy everything he uses, very much as people do in our country. What will he do in town?

Long ago the Swiss began to make watches. They made very good watches, and the Swiss government now has several schools where people can go to learn to make watches. It takes skill to make a watch. The Swiss make watches by the thousands; they send nineteen watches out of Switzerland for every one that they need to keep at home.

Some time ago I saw a wonderful instrument for explorers to use. If the explorer has one or two perfect watches and this instrument, he can

take it out at night in a strange place, look at the stars, and tell almost exactly where he is. This is a great help to an explorer. This instrument was made in Switzerland. It is called an *instrument of precision.* There are many instruments of precision needed in factories, colleges, and physicians' offices. The Swiss make many kinds of fine machinery and sell half of it to other countries. They have to buy all the iron and steel and tin and copper, but they can sometimes make a hundred dollars' worth of instruments from raw material that cost only a dollar.

They buy cotton and make cloth and embroidery. They sell fifteen times as much embroidery as they keep at home. They buy silk and make ribbon, and sell eight times as much ribbon as they keep. Some of their milk is condensed and sold in tin cans to neighboring countries, and they sell six times as much of this as they keep at home. They also sell milk chocolate, buying their chocolate and getting the milk from their own cows.

Every year we buy thousands of fine watches from the Swiss; also fine machinery, ribbons, and much Swiss cheese and chocolate. We send them grain for their bread, also some for the cows to eat. We sell them cotton and petroleum and automobiles.

The Swiss have no coal to run their factories, but that does not bother them. The streams tumbling down from the mountains have much power. The Swiss have water wheels that make electricity. The electricity runs their street cars and their factories and lights their houses. There are some country districts in Switzerland where every house has electric lights. A Swiss family uses more electricity than a family in any other country in the world. The houses in the Swiss cities are nearly all made of stone because there is plenty of stone in Switzerland.

THINGS TO DO OR TO THINK ABOUT

1. Do you think the Swiss are a skilful people? How would you prove it?
2. Tell about some Swiss schools.
3. What do we call the lines on the map and the globe that tell us how far from the equator a place is? Draw such a line on the floor map to show how far from the equator Switzerland is. Find a lake in the United States that is as far from the equator as Switzerland is. How do you know that your answer is right? Which is nearer the equator, Switzerland or the state you live in?
4. Here is a new kind of drawing to make. With the yardstick, draw a long line a few inches from the bottom of the blackboard. We'll call this the base line. Now near the left-hand end of the board, draw a vertical line one inch long up from the base line. Leave a space and draw another line up from the base line; this time, nineteen inches long. These two lines are supposed to show how many watches Switzerland sells to other countries for every one that the Swiss people make to keep for themselves. How could you label these two lines to make them show this? Draw lines from the same base line to tell the story about Swiss embroidery and Swiss condensed milk. Be sure to label each line. What title could we give to the whole drawing? Drawings like this are called *graphs.*

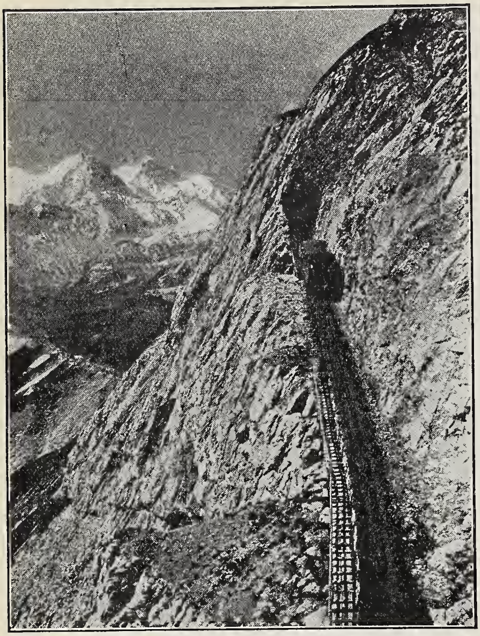


Fig. A. Up the side of the Swiss mountain and through the tunnel our cogwheel railroad car climbs.

SUMMER TRAVEL AND WINTER SPORTS

We have been traveling all day. We are tired. We reach a Swiss hotel. The manager sees us coming and walks to the door to meet us. He looks at us and speaks to us in good English. If we had been French, he would have spoken to us in French; if we had been German, he would have spoken to us in German; if we had been Italian, he would have spoken to us in Italian. A boy carries our baggage upstairs to the bedroom. It is sweet and clean and comfortable. We feel at home. We eat a good dinner and feel much better. During the night we wake up and notice a little sound. It is the quiet, sleepy sound made by falling water, as a snow stream tumbles down some little valley at the edge of the village. In the early morning we hear the tinkling sound of cowbells from the pastures on the hills. We look out of the window. The hotel garden is green with grass, and it has beautiful flowers, well-kept shrubs, and neat walks. On the hill back of the town we see pine trees, and far away the pink of morning sunshine on the perpetual snow of an Alpine peak.

We have a nice breakfast and go out for a walk. The streets are clean, the houses are neat and well painted. The shops are pretty. They have lace, wood carvings, jewelry, musical instruments, toys, chocolate, and many other things we want to buy. The people are polite. A little path leads off into the woods. We go along it and smell the clean odor of pine trees. We admire the flowers. We pass the gardens and orchards and terraced fields of the well-kept farms in this little valley. We say that this is a nice place to travel. It is warm enough to be pleasant and cool enough to make us feel like walking. If we are young and strong, we can climb the hills and mountains, climb as far as we like. Perhaps we can hire guides and climb to the top of a snow peak. This will take two days. We must sleep by night in huts that have been built for climbers far above the tree line. It is a great thrill to

climb for hours over snow and rocks and dangerous ice and stand finally with nothing above us but the sky, with snow-capped mountains and glaciers around us, and the valleys with their towns and cities far, far below.

If we want a hiking trip, Switzerland can please us. The country is full of pleasant little paths. You can put your pack on your back and walk from inn to inn. If you do not want to climb or hike, you can go to the top of the mountains by cogwheel railway, and thus get the fine view. Or you can stay at your hotel and take short walks, rest, and listen to music.

You can travel over all the country in automobiles and busses, or the railroad will sell you a special ticket. It is good on every railroad in Switzerland for two weeks. You can ride all day long and go wherever you wish, and it does not cost much.

Perhaps you now see why it is that every year thousands of people from the United States, from Canada, and from many other countries go to Switzerland for a rest and a change and to get something new to think about when they are home again.

The Swiss winter is cold, yet warm. The air is cold, as the thermometer, the snow, and the ice will show, but it seems warm. This is because in the valleys behind the high mountains there is no wind, and you can, therefore, feel the warmth of the sunshine. In this place where the weather is both cold and warm, there is a sanitarium for sick boys. The boys go out in the snow and sunshine wearing only a breech cloth as though they were in Africa. They are comfortable, and the sun bath helps to make them well.

Fig. A. The men are climbing an Alpine peak in Switzerland. See Figure 107-A.

Hundreds and thousands of people from England, Germany, and the United States go to Switzerland in the winter for snow and ice sports. The lakes and ponds are swept every night and sprinkled with water; so there is always a good surface. Some go to Switzerland to play ice hockey or even to take part in the international hockey games. Others

Fig. A. These men are playing the game of curling on an open rink in Switzerland.

like to do figure skating. Some waltz on skates to music. Professional teachers are there to teach you how to do these things. There are many contests, and the person who wins the golden skate has the greatest honor that can come to skaters.

The older men will often be on another part of the lake playing a game called *curling*, which is very popular in Scotland also. They use a stiff broom to push a polished stone across the ice. It goes spinning along. The point of the game is to make the stone stop at a certain place. The player whose stone stops closest to the mark wins. This is a very exciting game. There is a covered rink where match games of curling can go on even in a storm.

St. Moritz, in eastern Switzerland, is the most important center for snow sports. The town is spread out on the southern slope of the hill above a lake. The mountain keeps the wind away, and the sun shines warmly on the town and on the frozen lake. Mountains lie in front. Ice on the lake gets so thick that horse races are held there. It is even thick enough to hold a fence and grandstands and stables. Many thousands of people go out on the ice to watch the racing. The horses have special shoes so that they can stand up on the ice.

Coasting is another sport. Toboggans, bobsleds, one-person sleds, all kinds of sleds can be hired or bought. The courses are carefully arranged. There is one on which


Fig. A. In winter the Swiss lakes are frozen and skating is great sport. The skater at the right is Howard Nicholson, an American skater.

you can start and go winding about and down for five miles. A train will take you back, and you can coast down again.

The winter sport that requires the most skill is skiing. The ski is a long, narrow wooden shoe. It is about two feet longer than the person who wears it. The first time you try to walk on skis, you do nothing but fall down. Teachers will show you how to use them. The beginners go out on what they call the nursery slope. The slope is gentle and not very long. You can fall down here and nothing worse will happen than getting snow down your neck. After weeks of practice you learn to slide down without falling. In the ski contests you sometimes go a mile a minute down long, steep hills. Sometimes you jump a hundred feet. It is a thrilling sport.

On the skis you can go over soft, deep snow where you could not possibly walk in ordinary shoes. One can reach some parts of Switzerland in no other way in winter. The Swiss guides will not allow you to start on one of these trips until you have passed an examination. For more dangerous trips you must pass an even more difficult examination. In this way the guides make sure that you are able to meet the dangers of such a trip.

What do the Swiss do during all these winter sports? They haul snow to patch up the sled runs, they sweep the ice at night and spray it with water in the early morning. They teach skiing and lead parties across the snow fields. The Swiss are also busy taking care of the many visitors. They cook and clean, make beds, and serve tea. They have learned so well how to please that many people like to travel in Switzerland. The Swiss also win many of the winter sports contests.

Fig. A. This statue of William Tell and his son stands at Altdorf, in central Switzerland.

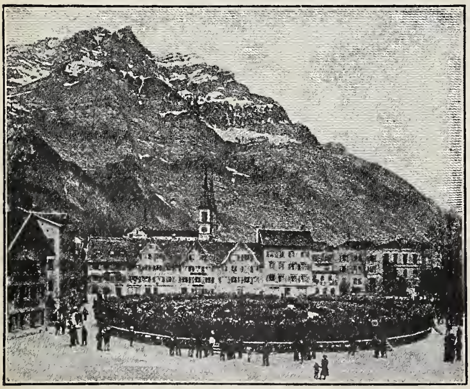


Fig. B. The citizens of a Swiss canton, or state, voting in the public square of their capital, Glarus.

THE SWISS PEOPLE

The Swiss are an intelligent people, a hardy people, a courageous people. They are a people who love liberty. One of their heroes is William Tell. More than four hundred years ago they built a chapel on the place where his house stood. The people wish always to remember him as one who helped to free Switzerland from some cruel rulers. Perhaps your teacher will tell you the story of William Tell.

The Swiss show in many ways that they are an intelligent and hardy people. Their mountainous country is a hard country to use, but they use it very well. If they plowed their hillsides carelessly, a few rains might wash their fields away, and they would have no fields. Therefore they plow the valley lands and make hay on the hillsides, so that the grass roots will hold earth on the hill. Sometimes they make the hillsides into terraces. See Figure 113-A. In other places they plant trees so that the roots will hold the earth on the hillside. In some places on the high pastures the soil is so shallow that the cows' feet would knock it loose. The Swiss have passed laws to keep the cows away from these places and let only the sheep and goats go there.

I have traveled back and forth in the Alps and I have scarcely ever seen a gully or a place where there had been a forest fire. Perhaps your teacher will get a report from the Bureau of Forestry at Washington about forest fires in the United States. The Swiss have forests scattered over their mountains so that they are near to every village. These forests are

cared for almost as carefully as we take care of parks and gardens in the United States. The little trees are planted in rows like rows of corn. When they are cut down, the wood is all carefully saved for firewood or building wood.

The Swiss are a courageous people. They have to be so. The herdsmen must follow the flocks to pasture, sometimes in places where a misstep might be death. Working in the forest, they risk death every minute. But when mountain climbers wish to climb mountains in Asia and Africa, nearly always there are Swiss guides there to help them do it.

The Swiss are a liberty-loving people. They love their country very much. Many times they have fought to keep it free from foreign rulers; but more important, they work for it every day. The Swiss government is a very good government. Some of the best and most intelligent people in Switzerland are the government officials, and they work for a very small salary. People who spend the government money, spend it honestly; so the government is very well run. For example, the government owns all the railroads, which it runs well and without waste. This is a very hard thing for a government to do. There are few rich people in Switzerland, and none are very poor. All the Swiss learn to work. They all go to school and are a well-educated nation. There are many schools in Switzerland where people learn how to become skilled workers.

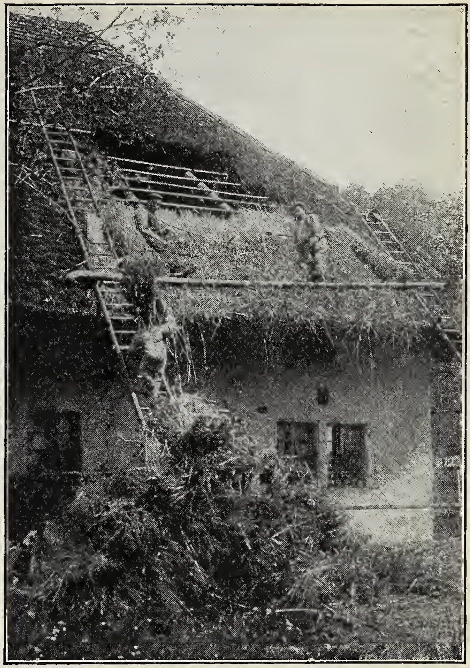


Fig. A. This farmhouse in Switzerland has a thatched roof. The workmen are repairing the roof with straw.

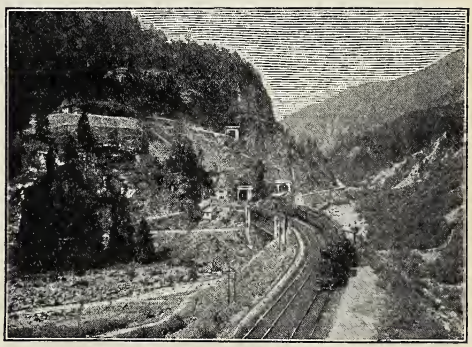


Fig. B. A tunnel entrance on a double-track Swiss railroad. Is there a wagon road in this picture?

Now you see how the Swiss have managed to have a good nation without having any ports or any ships to carry their trade to foreign lands.

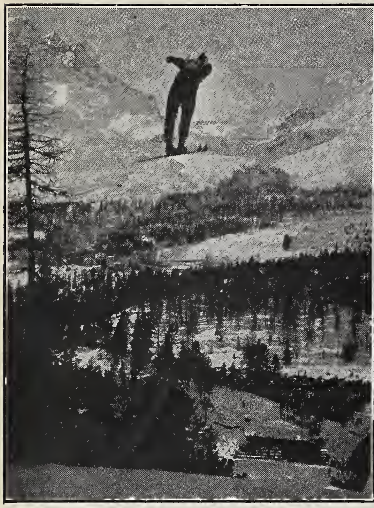
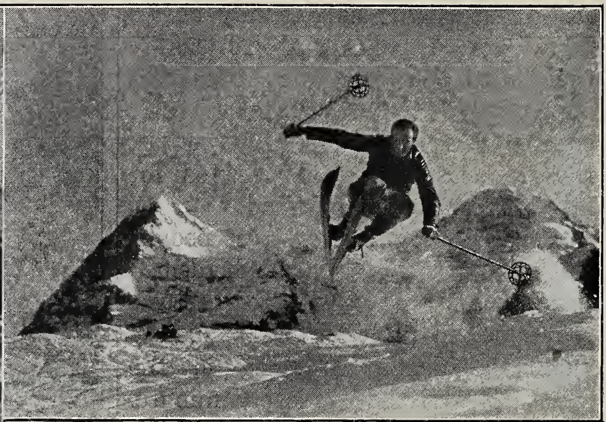



Fig. A. The ski-jumping champion of Switzerland. Thousands of people come to St. Moritz to see the ski racing and jumping. How do the things in his hands help the skier?

THINGS TO DO OR TO THINK ABOUT

1. Divide the class into eight groups. Then let each group choose one of these titles for a play:

(*a*) The Mountains of Switzerland in the Summer.

(*b*) The Valleys of Switzerland in the Summer.

(*c*) The Mountains of Switzerland in the Autumn.

(*d*) The Valleys of Switzerland in the Autumn.

(*e*) The Mountains of Switzerland in the Winter.

(*f*) The Valleys of Switzerland in the Winter.

(*g*) The Mountains of Switzerland in the Spring.

(*h*) The Valleys of Switzerland in the Spring.

After each group has finished giving its little play, the leader of the group may ask other children in the class to tell what people in our country or some of the friends we met in foreign lands would be doing at this time of year.

2. Look at the globe and try to guess how many times the United States is larger than Switzerland. How many languages do most people in the United States speak? How many languages do many people in Switzerland speak? Why do they learn to speak them? What are some of the languages they speak there?

3. Add Zurich and Geneva to the floor map and to the *Locations* list.

4. Add this trip to the map of *Trips That We Are Taking.*

5. How do the Swiss people manage to do some trading with people in other lands? Would they do more or less of this trading if the ocean touched Switzerland? Why?

6. What makes you think you would very much like to meet some real Swiss people instead of just make-believe?

7. Tell us a few reasons why there are no large cities in Eskimo Land. Then tell us just why the cities of Switzerland are on the plateaus instead of in the mountains. Why does Switzerland have more of her people in cities than the other countries we have studied?

8. How do the Alps Mountains help the Swiss to be very wonderful people? How do they help these people to earn a living?

9. After you know the story of William Tell, make up a play about this hero. Perhaps your music teacher has a talking-machine record of a part of the opera, "William Tell." When you hear it, see if the music tells you anything about the life of the Swiss people.

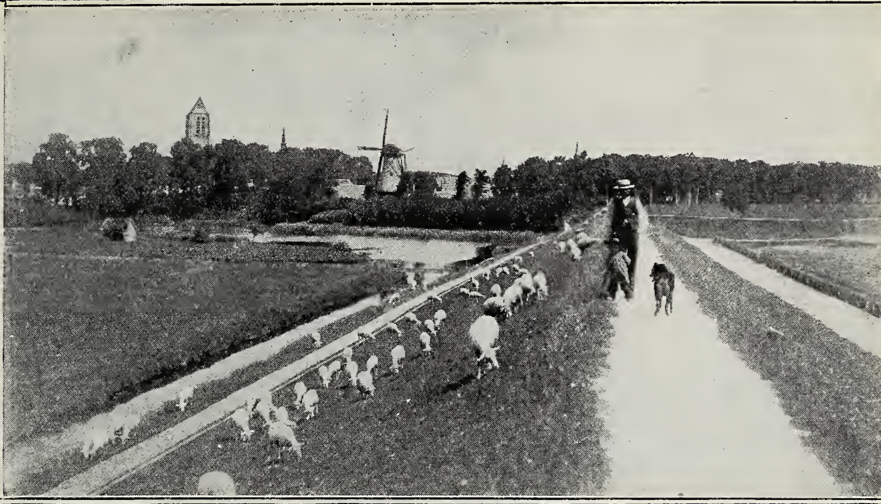


Fig. A. The man and boy are walking along the top of a dike. At the right side you see a little piece of sea beach. The wooden piles are driven into the sand to keep the waves from cutting the bank away. The sheep are grazing on the inner slope of the dike. The man is a shepherd, and the dog helps him drive the sheep. When the tide is in, the sea is higher than the land on the other side of the dike. You can see the difference in this picture. Scenes like this are very common in Holland.

HOLLAND, THE HOME OF THE DUTCH —A LOW, TEMPERATE REGION

N

THE FIGHT WITH THE WATER

Every day of your life you use many, many things that have been in Holland before they came here. You have traveled in different lands and have also used many, many things there that had once been in Holland. Now you are going to visit Holland, and you are going to discover why this is so.

You will be very much surprised to see so many people living in such a tiny country, but your trip will tell you why.

Nearly everyone in the United States speaks of the people of Holland as *Dutch*. Their country is *the Netherlands*, which means lowland. As you read this chapter, see if you can find reasons for the name.

It is easy to get to Holland. When we were going to Switzerland, we sailed from New York to Rotterdam, a city in Holland. As we go up the river to Rotterdam, we see that the country on both sides of the river is as flat and level as a floor. There is never a hill to be seen anywhere. This land is part of a delta, the delta of the river Rhine. Most of Holland was made of Rhine River mud. Look at the map (Fig. 134-A)

Fig. A. A map of the Netherlands, or Holland, the home of the Dutch people. As you read the chapter—Holland, the Home of the Dutch—find on the map each place mentioned in the text.

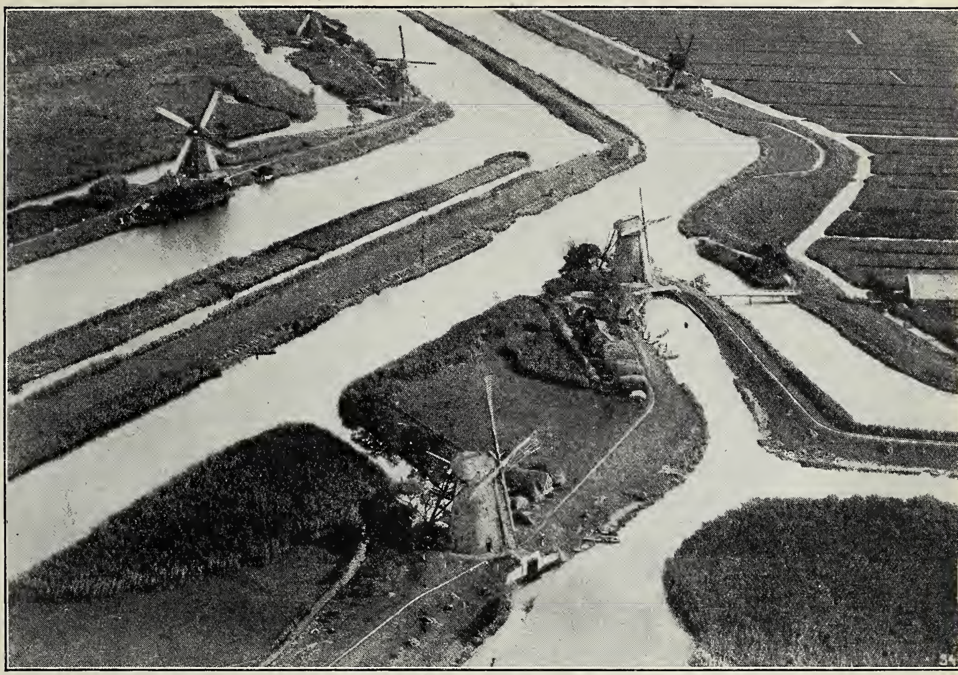


Fig. A. An air view of the polder lands in Holland. Find five windmills, two canals, and a dike. Can you see where water is lifted from one canal into another?

and notice how many mouths this river has.

As we travel up the river, we see that some of the houses stand high up on the banks, while others seem to be very low down. We see only their roofs behind the river bank. They are down low indeed, for much of the land of Holland is below the level of the river and even below the level of the sea.

How can houses and land be below the level of the sea? The D[illegible]ish people can tell you. Ma[illegible] All houses stand on an old se[illegible] not dry

We might say that H[illegible] that leaks war. She is at war all [illegible] Sometimes

She has been at war for many hundred years. She is at war with the sea and with the rivers. The men mostly win in this war, but they can never give up the fight, because they must keep on pumping the water from the old sea bottom where they now have their farms, on land that they have conquered from the sea. Long before the United States wa[illegible] storm, the w[illegible] State[illegible] Hollan[illegible] the dikes or break through the low sand hills along the seashore, which keep back the sea in some places. The wind often blows piles of sand up along the seashore. These are called dunes. In some places the sand dunes make a natural

Fig. A. A canal in Holland in the summertime. Compare this picture with Figure 138-A. Could you make up a story about the things you see in this picture?

places near the shore. They had to move the water away before they could make their farms. They began this by draining the swamps and lakes along the rivers. (See map, Fig. 134-A.) First they built dikes to keep the river from overflowing into the swamps. Then they dug ditches through the swamps to carry the water from the swamps to the edge of the dikes beside the river. Here windmills pumped the water up over the dikes into the river.

Look around Holland in almost ny direc[illegible] ee the big [illegible] in the [illegible]

Night and day, day and night, whenever the wind blows, the Dutch windmills swing their arms and pump water.

These lowlands from which the water must be pumped all the time are called *polders*. River polders are land that has been won from river swamps. Sea polders are land that the Dutch have won from the ocean.

As the years went by, the Dutch farms got more and more scarce, and the price of the land got higher and higher. At last there were no more river polders to drain; so the people began to drain the ocean. The ocean is very shallow in many [illegible]ces near Holland. It has been [illegible]t filled with Rhine mud. To [illegible] sea polder they start by [illegible] high bank, like a railroad [illegible] close a part of the ocean.

Fig. A. "What a job;" you say, "to fit all these big boulders into this dike!" The thrifty Dutch people did it, however, to keep the sea from their fertile land.

When this part of the sea is cut off, the pumps begin to pump the water out. Sometimes this pumping goes on for years. Finally the bottom is seen. The land dries off, grass seed is sown, and soon the old sea bottom is a very rich pasture, for the river Rhine has brought down much rich mud, and there are many rainy days in Holland to help the grass grow. The polder pastures are green indeed.

See the map (Fig. 134-A). Much of Holland is old sea bottom. There are thousands of farms in places where once oyster shells grew, fish swam, and boats sailed about. All the rain water that does not dry up and all the sea water that leaks in must be pumped out. Sometimes there will be three or four windmills in a row. They are called a gang. Each lifts the water three or four feet—almost exactly as the men do in the shawadif on the Nile.

Two things the Dutch must always do. As you already know, they must always pump water. Also, they must always watch the sea, because the sea is also always watching for a chance to win back what has been captured from it. If there comes a big storm, the waves may eat into the dikes or break through the low sand hills along the seashore, which keep back the sea in some places. The wind often blows piles of sand up along the seashore. These are called dunes. In some places the sand dunes make a natural

Fig. A. A canal in Holland in winter.

dike along the Dutch shore, but sand dunes are soft stuff. The waves may beat them down or the wind may blow them away. The dunes will not blow away if they are covered with grass. Therefore the Dutch are very careful to plant grass on all their dunes and keep it there.

When the sea starts to beat a hole in the dunes with its storm waves, the Dutch build stone walls out into the sea at that place to stop the force of the waves. Sometimes they pave the shore with big stones (Fig. 137-A). They even build concrete walls in some places where the sea is very dangerous.

A few years ago the Dutch government started to make a new piece of land by draining an arm of the ocean called the Zuider Zee. When this is done, enough land will be added to Holland to make a piece twenty miles wide and forty miles long. But how long do you think it will take the industrious Hollanders to do this job? Seventy years! The map (Fig. 134-A) shows that they plan to do it in four pieces. The first piece will take fifteen years. These pumps are run by large steam engines fed with English coal.

The Dutch have dug many ditches to get the water off the level land, and many of these ditches have been made wide enough for small boats to go up and down them. A ditch on which boats can go is called a canal. It is easy to make canals in a country that is so flat, and where the earth is soft and easy to dig as it is in Holland. In no other country in Europe or America are there so many canals on such a small amount of

Fig. A. In Figure 147-A the people are dressed as in an American city. In this picture, however, they are dressed in native Dutch costume. The children have wooden shoes. See the caps which the women are wearing.

land as in Holland. There are nearly as many miles of canals as there are of roads. In many places there is a canal instead of a road, or instead of a city street. Often there is a canal with a road beside it. A wide city street may have a canal in the middle of it. Sometimes the farmers will haul their products to market in boats, just as American farmers haul theirs in wagons or trucks. I once saw a Dutch farmer hauling hay from his field to his barn on a boat.

In winter the canals freeze over. Then the people go on skates both for business and for pleasure. Sometimes the people will skate and push a loaded sled in front of them and take their goods to market that way.

In summer it is very interesting to go in a canal boat through Holland. The villages are sometimes only one row of houses along the canal. Often we see wooden shoes sitting outside the doors. Wooden shoes keep the feet dry on the wet soil. Sometimes as you pass along on the canal, you can see children playing jokes on one another by hiding one another's wooden shoes that were set outside the door when the owner went into the house.

Miles and miles of these canals are above the fields beside them. This lets the boat traveler look down on the farms. If the canal bank should break, the water would run down and flood the farms. Do you think that we might call the Dutch a watchful people?

One of the most important men in Holland is the chief engineer of all the canals. Every Dutch boy who is ambitious would like to be this chief, this great official, the chief of *Water Staat,* as they call him. He is what the Dutch would call a big man.

Do you think the Swiss have many canals? Why?

Do you think that the Dutch do more fishing than the Swiss? As I traveled through Holland, I often saw old men and boys sitting on the banks of a canal or a stream with fishing poles in front of them.

The storks and the storks' nests are interesting things that one can see while traveling on the Dutch canals. These long-legged birds walk about the fields looking for food. No one disturbs them, for people think they bring good luck. Sometimes they build their nests on the tops of chimneys. They spend the winter in Africa and come back year after year to the same nests.

THINGS TO DO OR TO THINK ABOUT

1. Here is a new game. We are going to give you one or more words and then a blank space. In each blank space you may say the name of the people that fits these words:

Mountains ....
Igloos ....
Pueblos ....
Pemmican ....
Dense forest, rubber, Brazil nuts ....
Reindeer ....
Largest oasis in the world ....
Windmills and canals ....
Long camel caravans ....
Fur trappers ....
Black people hunting elephants ....
Zebras and giraffes ....

2. Build a Dutch windmill and add it to the school exhibit. You may write a short story telling how the people of Holland use windmills. You may write the story on a card and pin it to the windmill.

3. Make a sand-table model of Holland. Have it show how some of the land is lower than the level of the rivers or of the sea. Then explain how the people have come to live on this very low land.

4. Draw a large map of Holland and the water that touches Holland. How near the equator is Holland? How do you know? Draw a line on the map that will show this. Label it. How far east is Holland? Draw a line on the map that will show this also. Show the Rhine River and the Rhine delta. Name some of the tributaries of the Rhine. Show the North Sea and the Zuider Zee. What do we mean when we say that Holland is part of the Rhine delta?

5. Make sketches of a dike, a polder, a dune, a ditch, a swamp, a breakwater. Then tell what each of these has to do with the people of Holland.

6. Explain with a sand-pan model or a drawing how the Dutch are turning the Zuider Zee into farm land.

7. Draw a scene along a Dutch canal. How would this be different from a scene along the Suez Canal?

8. What makes the chief of Water Staat so important in the Netherlands?

9. Try to find pictures of Holland and bring them to school. Be sure to know the story of the picture you bring.

10. Make a sketch of the Rhine River and show all the streams that help its waters to reach the sea. Label a number of these streams.

11. Why do the Rhine, the Nile, and the Amazon rivers all have very large deltas, while some other rivers do not?

12. Copy the following and fill in the blanks:

Of the two countries, Holland and Switzerland, ... has more canals than .... But .... has more water power than .... This is true because ....

13. Point to North America, South America, Europe, and Africa. Name the people of each of these continents that we have read about.

14. Are the people of Holland more healthy and more intelligent than the people of the Amazon Basin? Give some good reasons for your answers.

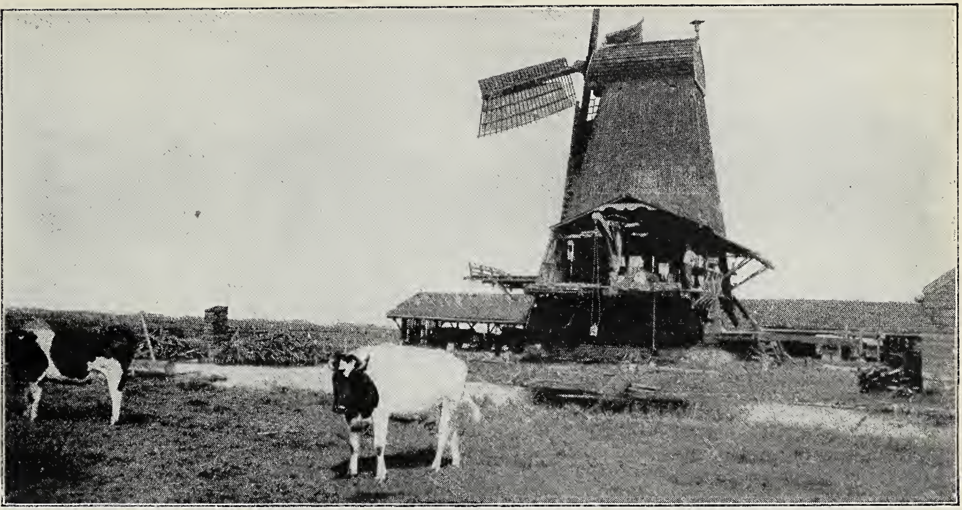


Fig. A. This Dutch farmer has a windmill to pump water and to keep his land from being flooded. Sometimes he uses the mill to grind his grain into meal for the cows to eat. He has dairy cattle to graze on the thick grass of the level pasture lands and to give milk. He makes excellent cheese and butter from this milk.

THE DUTCH FARMERS

Holland has what we call a temperate climate; that is, it is not extremely cold like the climate of Eskimo Land, and it is not extremely hot like the climate of the Amazon Basin or the Sahara Desert. It is in between these two extremes. Holland is less than one third as large as New York State, but it has nearly three fourths as many people. How does such a little country support so many people? We shall see that the Dutch are intelligent, thrifty, hard-working people who make good use of what they have. To begin with, the Dutch use their land very well. Many of the low polders are too wet to be plowed. Some are so low that when you walk on the thick sod, it seems as though you were walking on a bag of moss, because the soft mud beneath the grass sinks under your feet. This makes splendid pasture for the many cows that the Dutch farmers keep. These cows produce three times as much milk as the people drink. Most of this surplus is made into cheese. The Dutch people make very good cheese. The people of the United States are glad to buy tons of cheese made in Holland. The Dutch farmers buy corn and cottonseed from America, take it in their ships to Holland, feed it to their cows, and then send the cheese back to us. Sometimes the farmer will let his windmill grind the corn and other grain into meal for the cattle to eat.

The potato fields on Dutch farms yield, on the average, more than twice as many potatoes an acre as do the potato fields in the United States.

Fig. A. A field of hyacinths in bloom in Holland. Do you know another place where Dutch bulbs blossom?

Flowers are the most wonderful crop of the Dutch farms. At Christmas-time perhaps you gave your mother some bulbs to bloom in the early spring. These bulbs may have come from Holland, for Dutch flower farms cover hundreds of acres and send tons of bulbs to the United States and other countries. In early April the Dutch bulb farms bloom with beautiful hyacinths. These are followed by tulips and by other flowers. It takes skill and much patient work to make a crop of bulbs. Some kinds of bulbs cannot be sold for blooming until they are six years old.

A few acres of land will give jobs for many people and will bring in a large amount of money if it is used for growing bulbs. In the same way the Dutch grow little trees which they send to other countries to be planted in orchards, yards, gardens, and parks. By selling these bulbs, trees, and cheese, they get money to use in paying for wheat, meat, cotton, and other crops that are grown on the large farms in America and in other foreign countries. There are government schools in Holland where people are taught how to grow bulbs and trees.

THINGS TO DO OR TO THINK ABOUT

1. Pretend that the windmill in Figure 141-A had told you a story of its life and work. Write the story.
2. Tell from Figure 134-A one reason why Holland is a good country for farming and dairy cattle.
3. Tell how the farmers in the central and southern parts of our country help the Dutch farmer.

DUTCH TRADERS AND DUTCH CITIES

Holland and Switzerland are about the same size. Both are used carefully and well, but Holland has nearly twice as many people as Switzerland. If you think of the surface of the two countries, you can tell one reason for this.

More than half the people of Holland live in cities. There is not land enough for them to live on farms. Holland has twelve cities with more than 50,000 people and less than 100,000 people. Switzerland has but three. Now look at this table. What does it tell you about the largest cities of these two countries?

FOUR LARGEST CITIES

HOLLAND	PEOPLE
Amsterdam (1933)	772,364
Rotterdam (1933)	586,804
The Hague ('s-Gravenhage) (1933)	459,885
Utrecht (1933)	157,924

SWITZERLAND	PEOPLE
Zurich (1933)	312,600
Basel (1930)	148,063
Geneva (Genève) (1930)	142,812
Bern (1930)	111,783

Why does Holland have so many more cities than Switzerland?

Many of the Dutch are traders. Look at the map of Europe. You see that Holland is on the coast. All ships from southern Europe to northern Europe and from northern Europe to southern Europe must pass the coast of Holland. You

Fig. A. A canal street in Amsterdam. Is this street quiet or noisy?

remember also that we went to Switzerland on a steamboat from Rotterdam up the river Rhine. Many, many tons of the goods that go from America to Germany and Switzerland go up the Rhine through the Dutch cities. Many of the things that Germany and Switzerland send to countries over the sea come down the Rhine in boats and are loaded on to ocean vessels in the Dutch cities. You see that the Dutch seaports are ports for the people of Holland and of other countries also.

Look at the map again, and you

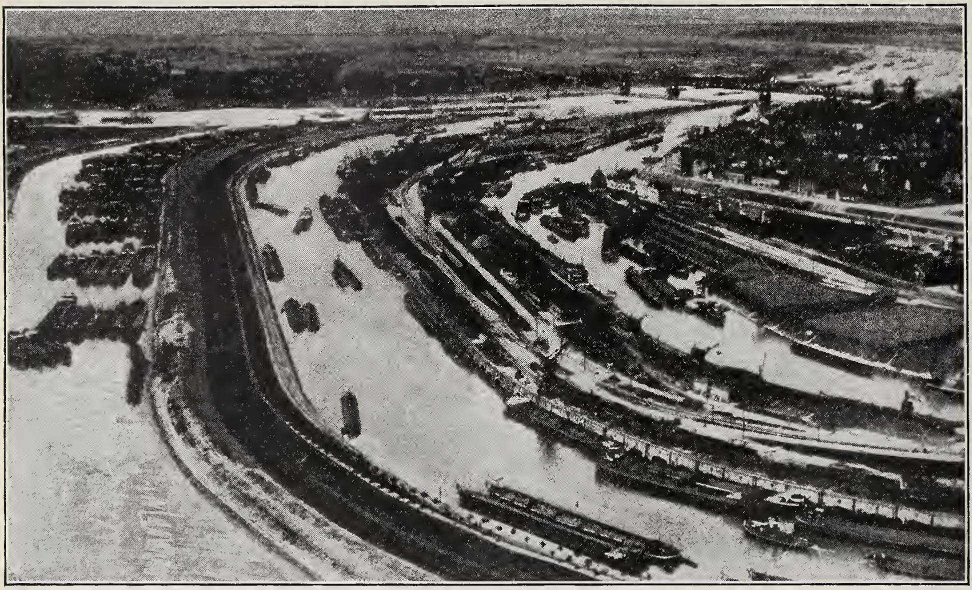


Fig. A. A part of Germany is much like the Low Countries. This harbor is at Duisburg, just over the Netherlands border, on the Rhine River in Germany. Big steam shovels scoop out the soft delta land and form a deep ditch. Then water is let in. The ditch becomes a dock. Ships load and unload in the quiet water alongside their piers.

will see that England is near Holland. Holland, you see, is located at a kind of crossroads. The roads from England to Switzerland and from northern Europe to southern Europe cross each other at Holland. That gives the Dutch a fine chance to sell things to the people of other countries.

For hundreds of years these farms of Holland have made a good food supply, and the people, when they were not busy with their farm work, spun yarn, wove cloth, and made other things to sell. Long ago Holland was the richest country in Europe, and the greatest country in making things to sell to the people of other countries.

The Dutch are also great fishermen. They get in their boats and sail out into the Zuider Zee and on out into the North Sea and bring back thousands of barrels of fish. They have been doing that for a very long time.

When the fishermen were not catching fish, they would load their boats with bolts of cloth and cheeses and bulbs and little trees and sail off to some other country to sell them. Then they would buy some of the produce of that country and bring it back to Amsterdam or Rotterdam. Thus the Dutch merchants would have goods from southern Europe and northern Europe on hand to sell to anyone who came there. By that means the cities at the mouth of the Rhine became trading cities.

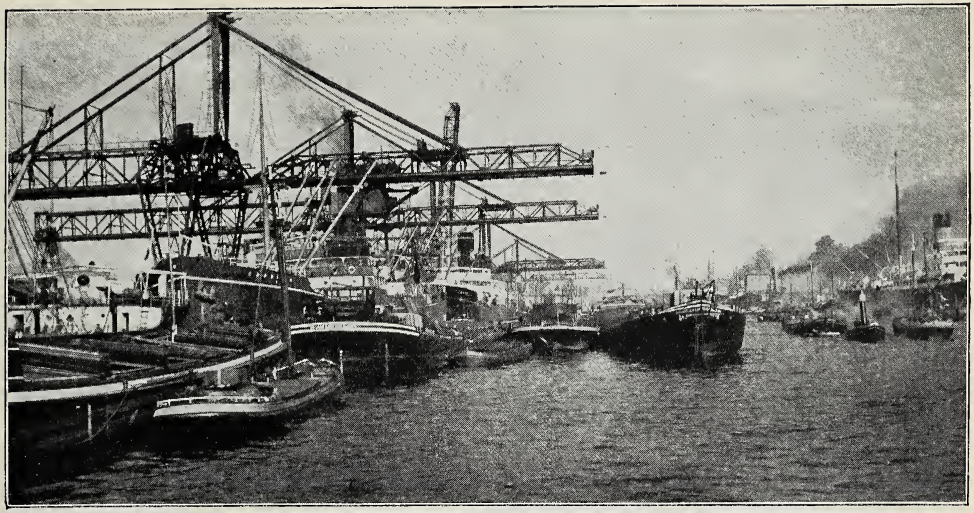


Fig. A. Because Holland is at one of the crossroads of the world, the Dutch harbor is a very busy place. This picture shows some of the many boats usually to be found in the river at Rotterdam.

Since the Dutch were good sailors, they sailed away soon after Columbus discovered America and took possession of some land far away southeast of Asia. It is now called Netherland India. Your teacher will show you on the globe where Netherland India is. These islands are many times larger than Holland, and they have several times as many people as the mother country has.

These islands are in the tropics. They have a rich agriculture. The Dutch manage much of this and own most of the factories, warehouses, and ships; so that many shiploads of the exports of Netherland India come to Holland. These islands send sugar to Holland and to several other countries. They produce over a third of all the rubber in the world and nearly all the cinchona. Cinchona is the bark of a tree. It is used to make a medicine called quinine. The Dutch know more about how it should be grown than any other people in the world. Netherland India also ships tobacco, tea, coffee, nutmeg, cloves, and other spices. All these things come to Rotterdam, and other Netherland ports for sale to the Dutch people and to those of other countries.

The Dutch steamships now sail to every continent. They bring back the things the Dutch people want and take out the things the Dutch people have to sell.

How many languages do you suppose an educated Dutchman needs to know? It is not far from Rotterdam to the boundary of Germany, where they speak German, nor to the boundary of Belgium, where they speak French. It is a short distance

Fig. A. A cheese market at Amsterdam. In the piles are round Dutch cheeses. The boat in the foreground has sailed up one of the many canals as far as the market building. The cheese is unloaded directly from the boat to the market.

across the water to England, where they speak English; and a Dutchman in his warehouse will often in the same hour speak English, French, German, and Dutch as easily as a boy in an American school can talk about baseball, his lessons, and lunch.

The Dutch have done much hard work in helping to build up their trade. The old city of Amsterdam had a nice, safe harbor on the Zuider Zee. This was all right long ago when ships were little and did not need deep water. (Fig. 154-A.) The steamships we now use would stick fast in the mud long before they got to Amsterdam. Therefore the Dutch government has dug a canal from the North Sea straight through the sand dunes and farms to Amsterdam. In the outskirts of Rotterdam they have had to make room for ships by taking nice farms and digging them out to make great docks where ships can sail in to load and unload their freight.

The harbor of a Dutch seaport is a busy place. Many little boats swarm around the big ocean steamers, like flies around a lump of sugar. Some will be long boats that are loading to go up the Rhine to Switzerland. Others will be canal boats going to near-by Dutch towns and villages. Some may be little rowboats going a block or two in the city, just as we would use a truck or wagon in a town or city. Many streets in Rotterdam and Amsterdam and other cities are canals.

A Dutchman once said he knew a city where the people live at the tops of trees like rooks. What do you think he meant? He was talking about the piles, the trunks of trees that are driven in the mud as foundations for buildings in the Dutch cities. You cannot build a stone or brick house in soft mud. It must have a firm foundation or it will sink into the mud or possibly upset. The Dutch cities on delta mud have no firm foundations; so logs or piles are put down and the walls for the buildings are on top. Even by this means a heavy wagon rumbling along the street shakes a

Fig. A. The city of Flushing, Holland, and its stone sea wall. The houses are built of brick. Deep in the ground beneath the wall are rows of piles. They give a firm foundation in the soft mud.

whole city block. The city seems as though it stood upon jelly. One big building in Rotterdam has 3,400 piles under it. You may see along the river a big stone wall. It looks so strong and solid that you might think it was founded on bedrock. Instead it stands on top of poles which have been driven into the mud. It is a lucky thing that poles buried in the mud do not rot. The water keeps them from decay. I saw a pile pulled out of the mud in Rotterdam when they were building a new dock. The harbor master told me that it had been put down in the year 1386. When he cut it with an ax, it looked as new as last year's logs. The ships that carry American grain and cotton up to Switzerland often bring back piles and stones for foundation walls of Dutch buildings.

As the delta has no stone and there is no room for forests in Holland, most of the Dutch buildings are of brick made by burning Dutch clay with fire made of English coal. You remember that in Switzerland most of the houses were of stone or wood. These two things the mountains have and the delta country of Holland does not have.

THINGS TO DO OR TO THINK ABOUT

1. Find Netherland India on the globe. What important line on the globe passes right through some of these islands? What two other lands have we visited through which this same line passes? There is one important way in which all three of these lands help the world in exactly the same way. What is it?

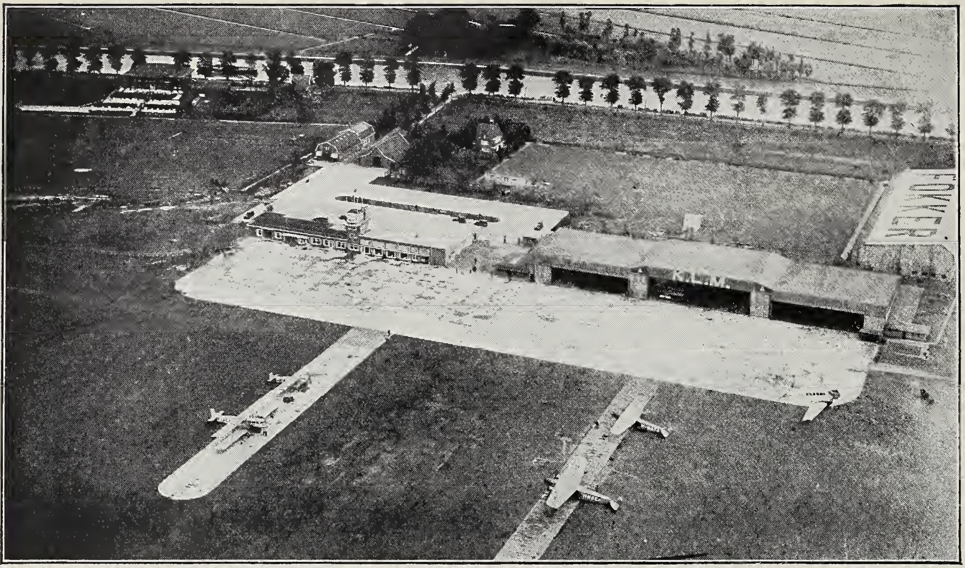


Fig. A. Airplanes are stored and repaired in buildings called airdromes. This airdrome is at Amsterdam, Holland. See the canals in the background of the picture.

FACTORIES AND PEOPLE

Many of the people of Holland make their living by working in factories. There are several good reasons for this. One is that the people are good workers. They are big, strong people; they are willing to work; they are intelligent; and they take good care of themselves. The boys and girls all go to school. Some people claim that Holland has the best public schools in Europe. There are no beggars. If people are sick or poor, there are careful plans made to take care of them. They are well looked after.

Holland has to buy many of the things she uses in her factories, but she can do this very easily. The ships sail into Rotterdam or Amsterdam between the dikes and green meadows, unload the raw materials for the factories into boats which run down the canal, and in an hour or two they may be at the factory door. Some Dutch factories send rayon and other artificial silk to many countries. Others send electric things and radio materials. Others send paper. Some send iron. To make iron the Dutch buy their coal from England and their iron ore from other countries, and their ships unload this coal and ore right beside the iron plant. Can you tell why the Dutch have a better location for factories than the Swiss have, and why the Dutch rivers are better in one way and worse in another?

Some of the milk from the Dutch farms is mixed with the chocolate from Africa and made into milk

chocolate. Others take palm oil from Africa, tallow from the United States, soy beans from China, and some milk from the Dutch cows and make something they call margarin, which tastes like butter. The Dutch send margarin also to other countries. Even with all these factories, it is often very difficult for a young man to get a job in Holland. Therefore many educated Dutch people work in other countries. Not long ago one of the Dutch engineering colleges found that a third of its graduates were working in other lands.

Before railroads and steamships made it so easy to travel, the people of different valleys or towns or countries usually had their own style of clothes. The Dutch had some very interesting-looking clothes. A few of the Dutch people still wear the native costume (Fig. 139-A), but most of them now dress like the people in the United States; and we in turn dress as do most of the people of European countries. Trains and boats and books and pictures are doing much to make the people of many countries look alike, act alike, and think alike.

This lowland of Holland is the best known lowland in Europe, but Europe has several other lowlands. Indeed, Holland's neighbor on the south, called Belgium, has some of the same kind of land that Holland has; and Holland's neighbor on the east, called Germany, has some of the same kind of land, although it does not have so many people to the square mile as does Holland. Perhaps your teacher will tell you something about a square mile of land near your school.

Fig. A. This man lives in Walcheren. Find Walcheren on Figure 134-A. It is the little Dutch Island nearest Scotland. The man is a farmer. He put on his best clothes in order to have his picture taken.

In northern Italy is the Po Valley, another famous lowland; and in the west of France, near the Bay of Biscay, your map will show that there is another lowland. The east coast of England is another lowland. We will learn more about those lowlands in another geography book, which we shall study in another grade.

THINGS TO DO OR TO THINK ABOUT

1. What do we call goods that come into a country? What do we call goods that a country sends to other countries? Make a chart of *Dutch Imports and Exports*. Make this like the chart about Switzerland. Be sure to show the difference between the goods from Holland and those from Netherland India by print-

Fig. A. The birds are storks. They have made a nest on top of an old chimney in a Dutch city. Where will the storks spend the winter (page 140)?

ing the letters *N. I.* alongside the products from these islands.

2. Add the four largest Dutch cities to your map and to the location lists.

3. Add this trip to the map of *Trips That We Are Taking.*

4. Do you know what a debate is? Then you also know what the word *Resolved* means, do you not? So divide the class into two teams and have a debate about this: "*Resolved,* That Switzerland is a more interesting place than Holland in which to live." Be sure that one member on the Swiss team and also one member on the Dutch team tells about some one of these topics:

(*a*) The kind of food the people eat, and how they get it.

(*b*) The kind of clothes they wear.

(*c*) The kind of houses they live in and why.

(*d*) The kind of work they do, and the tools they have to help them.

(*e*) What they use to heat their houses, and where they get it.

(*f*) What they use to run their machinery, and why.

(*g*) What the boys and girls and the grown-ups do to have fun.

(*h*) How each country helps the rest of the world.

(*i*) How the rest of the world helps each of these countries.

(*j*) The scenery of each.

5. Here is a drawing that you will want to make so carefully that you can keep it. Divide a large sheet of paper into five parts. In each part, make a sketch that will show one good reason why so many people in Holland live in cities. When you have finished, show your paper to the rest of the class. Then the class may vote to choose the drawing that tells this story the very best.

6. Suppose you had your choice of living either in Holland or Switzerland. Then suppose that you wanted to choose the one in which you could learn most about trading with the rest of the world. Which one would you choose? Why has this country become such a large world trader? Why are there so many Dutch sailors?

7. How are Rotterdam and Amsterdam like some cities in our country? How are they different?

8. Why are the large cities in Holland larger than the large cities in Switzerland? What do we mean when we say that a city is large?

9. Count the houses in a certain distance on a city street, on a village street, and on a country road. How many people do you think you would find in each? Which has the greater density of population?

10. Make a sketch of a Dutch scene that everyone would know was Holland, even if you did not label it.

11. Where would you expect to find the people working harder, in Holland or in Netherland India? Why do you think so?

12. Would the rivers in Switzerland or in Holland help the people more? In which of these countries would the rivers worry the people more and give them more work? Why?

13. Make up some plays about the Dutch people getting land from the sea and about what they do with this land.

Fig. A. A part of the harbor and city of Gloucester, Massachusetts. Why are there so many ships in the harbor?

SOME PEOPLES OF THE SEACOAST—NEW ENGLAND, NEWFOUNDLAND, NORWAY

No

GLOUCESTER, A FISHING PORT

This is going to be the finest chapter yet for making a lot of plays. And for every play we make, we are going to draw a quick, rough sketch on the blackboard to show just what the scenery of the play looks like. Then, maybe, some of the artists in the class might like to copy these rough blackboard sketches on large-sized cardboard. If they would, we could keep the cardboard sketches for movable scenery and repeat all the plays for the school assembly.

Sam Lawrence lives in the city of Gloucester, a small seaport on the Atlantic Ocean. The boy is ten years old. He wants to own a fishing boat when he is a man. The people of Gloucester have been fishermen for more than three hundred years. In 1623 some English fishermen sailed into the harbor at Gloucester, anchored their ships, and built some racks for drying fish. Then they built their houses and sailed out to sea and began fishing. From that day to this, fishing has been their chief business. Sam's home town of Gloucester is the greatest fishing port in the United States.

Sam's father owns a fishing schooner. This boat is named *Hester*. The fishermen of Gloucester often name their boats for their children, and Hester is Sam's sister.

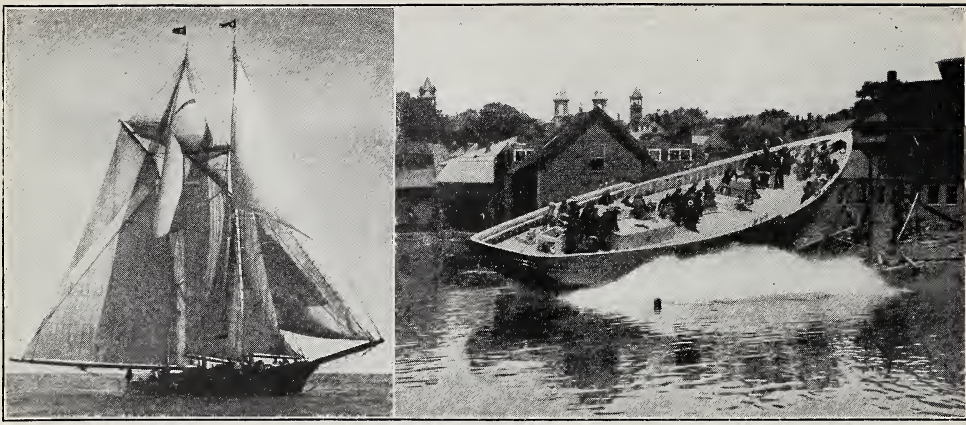


Fig. A. Here are two pictures of the *Hester*, Captain Lawrence's boat. After being built at the shipyard, she slides into the water. Then her masts and sails are attached and she is ready to go.

Fig. B. Captain Lawrence is telling the children something about a crab.

The boat has two masts and is sometimes known as a Gloucesterman. Early in the spring Sam's father sails the *Hester* around to the shipyard; a strong rope is fastened to her, a steam engine winds the rope around a drum and pulls the schooner up a little railway until she is out of the water. The ship is to have her spring overhauling. The bottom is scraped, all the little cracks are stuffed full of tar-covered fiber called *oakum*. This keeps the water out. Every inch of the ship is painted so that the wood will not get wet and rot. If any of the ropes are worn, they are replaced with new ropes. She gets a new sail and several patches are put in the old sails.

When everything is done, the *Hester* slides back into the water and Captain Lawrence gets ready to go to sea. They must take all that the men need to eat for three or four weeks, except fish. We see them loading barrels of flour, sacks of potatoes, some ham and bacon, many boxes of canned food, a barrel of apples, and bottles of lime juice. Then they put in tons and tons of ice. This is to make the ship into a refrigerator, so that

fish can be kept as fresh as when they are caught.

The *Hester* is now ready to sail Down the harbor she goes with Captain Lawrence, the mate, and the eight men called the crew. One of the men will go as cook. He will do no fishing, but his work will be to feed the hungry men, and he will receive a share of the profits as his pay. Sam, his mother, little brother, and two sisters, get into their automobile with some other children and ride down to the point. They want to see the boat sail out of the harbor and into the sea. Sam and the others walk out to the end of the sea wall, or breakwater, that has been built to keep the waves out of Gloucester harbor. (Fig. 153-A.)

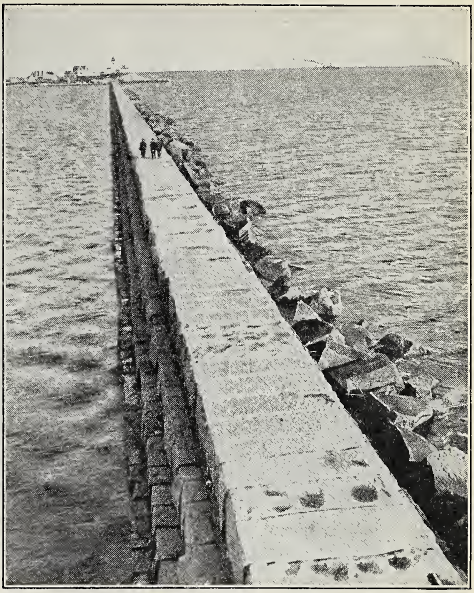


Fig. A. Sam, his mother, brother, and sisters walked along this long sea wall to the lighthouse in order to watch their father put out to sea in the *Hester*. See the ships in the far distance.

As the *Hester* sails out of the harbor, she passes so close to the end of the wall that Sam can see the mate standing at the wheel steering the schooner. They all wave good-by to their father, who is standing on deck waving good-by to them.

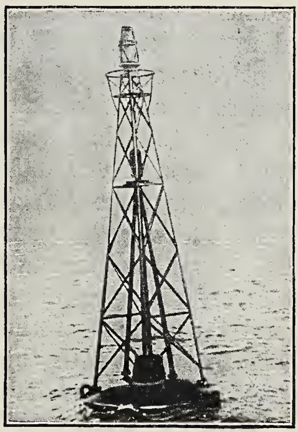


Fig. B. The mate of the *Hester* knows just where to sail in the shallow waters because the channel is marked by buoys like the buoy in the picture. This is a whistling buoy. Every wave makes it whistle. Even at night the sailors can guide their ships by the sound of the whistle.

As she passes the point, she changes her course and sails out into the ocean. The mate knows just where to sail in the shallow water, because the channel is marked by buoys. These are floats that are chained to the bottom to show where the deep water is. Sam watches the boat every second. Soon he can no longer see the men. Then the boat seems to get smaller and also lower. Finally her hull seems to go down behind the water. Sam can see only the sails. In a little while he can see only the tops of the sails. Then the *Hester* is out of sight. Sam's eyes are very sharp. Almost at the place where he saw the *Hester* disappear, he sees the top of another boat, and beyond that is a little cloud of smoke.

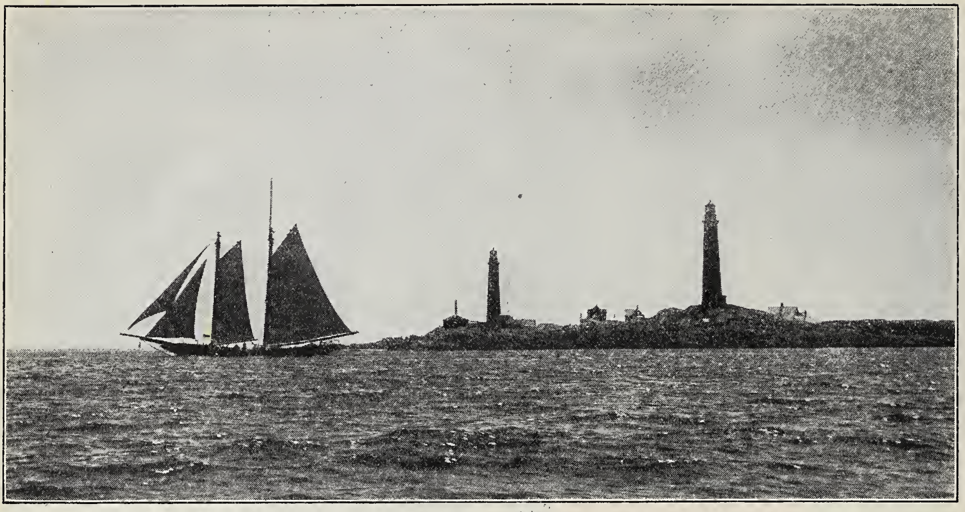


Fig. A. Captain Lawrence and his crew in the *Hester* standing out to sea. They are on their way to the open sea in order to catch mackerel. See the Gloucester lighthouses.

Sam knows that the smoke stands up in the sky above the place where a steamer is passing. Why can they not see the steamer? It is because she is down below the horizon. The *horizon* is the place where the sea and the sky seem to meet. You can understand the way the ship goes down behind the horizon if you look at a globe. Put your finger down flat on the globe. Now push your finger away from you farther and farther until it finally disappears and goes down behind the surface of the globe. It is just that way with the surface of the sea. It is round like the surface of the globe or the surface of a ball. The ships, as they sail away, go over the horizon and are soon out of sight. Explain how the boats in Figure 153-A show that the surface of the earth is curved. Figure 15-B will also help with this problem.

FISHING FOR MACKEREL IN SAILING BOATS

Captain Lawrence is sailing away in his schooner to meet the mackerel. The mackerel is a fish that lives in the open sea. Like the birds, mackerel spend the summer in the north and the winter in the south. Each spring Captain Lawrence and many other fishermen sail down the Atlantic coast to Virginia. There they meet the mackerel swimming slowly northward. They sail until they meet a school of mackerel. Many fish swimming together are called a *school*. The fishermen get out their big nets and carry them around the school of fish and catch hundreds of them, almost enough to load their boat. The mackerel are quickly packed in the ice. Now Captain Lawrence sails away as fast as he can to the nearest port to sell the

Fig. A. Fishing for mackerel. After you have read page 154, tell about this picture.

fish. He sells mackerel in Norfolk, in Cape May, and in New York. After three or four weeks the mackerel have gone farther north. The boats catch some not far from Gloucester and sail with them to Boston. Then the schooner sails for home. She gets there one night after dark.

How do boats find their way into the harbor at night? By means of lighthouses, tall lighthouses with signal lights which tell the sailor where he is. The lights on different houses are different; some are white, some are red, some shine all the time, some wink quickly, some wink slowly. Captain Lawrence has a big map that shows every harbor and tells him just how every light looks. Even at night he can know by the kind of light just where he is on the coast. He can read the lights in much the same way that you read a book. The letters and words on this page are really a set of signals.

There is great rejoicing when Captain Lawrence and his crew get back. All are safe; no one has been sick or hurt, and they have had a good catch. That means that Mr. Lawrence has some money in his pocket. Sam can have the little boat his father promised to give him as a reward for his good record at school. Sam's boat is sixteen feet long. It is called a catboat and it has a mast and a sail. In it Sam sails up and down the harbor when he has an older person to go with him. He hopes that he will learn to be a good sailor before he is grown. He must be a good sailor if he is to own a fishing schooner some day.

It is great fun to sail a little boat. As you learn to do this, you can make the boat do more and more things you tell it to do. Sam spent nearly all the next summer learning to sail into the wind. That is to say, when the wind was blowing from the north he learned to sail his

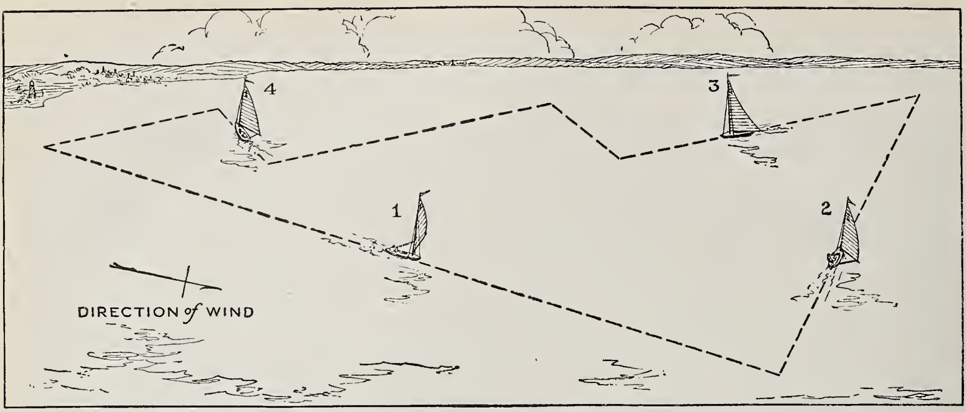


Fig. A. Find in this picture the direction of the wind. How is boat 1 sailing? How is boat 2 sailing? Why are boats 3 and 4 taking a zigzag course? Are they tacking?

Fig. A. These two boys live in Gloucester. They have sailed their boat out of the harbor.

boat north by tacking it back and forth as shown in Figure 156-A. This was something that the Phoenicians and the Greeks and the Romans did not know how to do. They could only sail with the wind.

Sam loves the sea. Nearly everybody who lives near the sea loves it. It is only a short walk from the town of Gloucester across the little peninsula to the shore of the ocean. In some places the shore is as high as the top of a house and made of solid rock. The waves have beaten upon it and have worn away all the earth long ago. In some places the rocks are red; in some places they are gray. Sam loves to see the shore when there is a storm. These storms, when the wind blows from the northeast, are called *northeasters*. It is fun to watch such a storm from the land, but no Gloucesterman wants to be on the sea at that time. The waves rise up higher than a man's head. They curl over and dash against the rocks. White foam climbs high and runs back. Drops of water, called spray, blow in your face. You can taste the salt water. No two waves are alike. Sam has often seen visitors to Gloucester sitting by the hour where they could

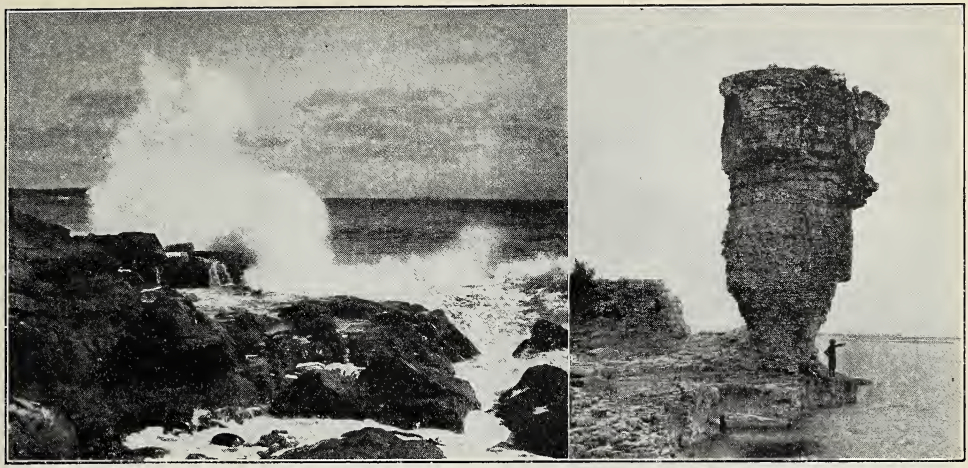


Fig. A. Much of the shore of New England and southeastern Canada is rocky. The storm waves beat against the rocks. The salt spray flies in all directions. The water beating against the rocks carved out the "flower-pot" which you see in the picture at the right.

watch waves dash on the rocky shore. Waves seem to charm people.

In several places near the town of Gloucester the shore is low and sandy —strips of sandy beach between two rocky places. Here the waves beat upon the sand, and, in quiet times in summer, Sam and his friends go here to swim in the waves.

Sometimes Sam and his family get into their automobile and go to some favorite spot along the shore. Sam likes to go to a cape called Folly Point. A cape is a point of land that sticks out into the sea. Folly Point is very pointed and rocky. You can see the ocean on three sides of you and ships near by and far away.

On the way home, Sam and his family come around the western side of the cape. On this side is a bay. There are no big waves like those on the ocean side of the cape. In this bay there are plenty of clams. When the tide runs out, narrow strips of sand called *sandbars* are left uncovered. When the clam digger sees in the sand a round hole smaller than the end of your pencil, he knows a clam is getting air through this hole. The clam digger has a big fork that looks very much like the garden fork your father may use in the garden. He digs up the sand with the clams in it, picks the clams from the wet sand, puts them in buckets, and takes them to market. Clams are good to eat. Clams and oysters are cousins. Oysters live on the bottom of sandy, salt-water bays, but clams live a few inches below the surface of the sand.

The seashore along a part of this bay is low and flat and muddy. It is a salt marsh with tall green grass growing in it. Sometimes the sea rises above the surface of the land,

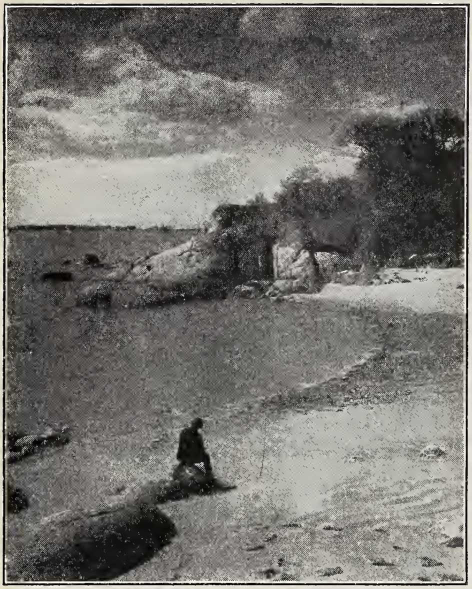


Fig. A. Here and there the shore is low, flat, sandy, and good for surf bathing.

but mostly the land is above the water. Some of the plants growing here are higher than Sam's head.

Sam is fond of boats, whether they are in the water or on land. He likes to go to the shipyard and climb over the new boats that are being built. Some of them are schooners for fishing at sea, and some of them are pleasure boats called yachts. Many people who own yachts sail up to Gloucester in summer from New York and Boston. Some yachts are small, some are large. Some have sails only, some have sails and engines, too, and some have only engines.

THINGS TO DO OR TO THINK ABOUT

1. Let us begin by making some plays. We may call them:

(*a*) Overhauling a Sailing Schooner in the Spring. (Be sure to remember the scenery. This time, it might be a large picture of the boat itself and the dock.)

(*b*) Getting Ready to Go on a Fishing Trip.

(*c*) On Deck as the Boat Leaves the Harbor.

(*d*) On Shore as the Boat Leaves the Harbor.

(*e*) Catching Mackerel. (What will the blackboard scene be this time?)

(*f*) Selling Mackerel.

2. Suppose you were on shore watching a ship coming back into the harbor. Which part of the ship would you see first? Why?

3. Do you pass a lake or a pond on your way to school? Watch it for several days. What does it look like on a windy day? What does it look like when the air is calm, with no wind? Could you guess, from this, what makes the ocean have waves? What would make the ocean have higher and rougher waves sometimes than it has at other times? What do the New England fishermen call bad storms on the ocean? Why do they give them this name? Have you ever watched a weather vane during a storm? If you have, in what direction was the wind blowing at that time?

4. Below are several words used in the story. Prove that you understand what you have read by using each word correctly in a sentence.

school	**lighthouse**	**tacking**
peninsula	**northeaster**	**cape**
yacht	**catboat**	**clams**
schooner	**harbor**	**sandbars**

5. Bring to class all the pictures of different kinds of lighthouses that you can find. How are they alike? How are they different? How do they help the sailors and the fishermen?

6. What is a buoy and what is a pilot? How do buoys and pilots help people at sea?

7. What would happen to plain sand that had the ocean waves beating on it all the time? What would be left along the seashore at Gloucester after all the sand had been ground up and washed out to sea?

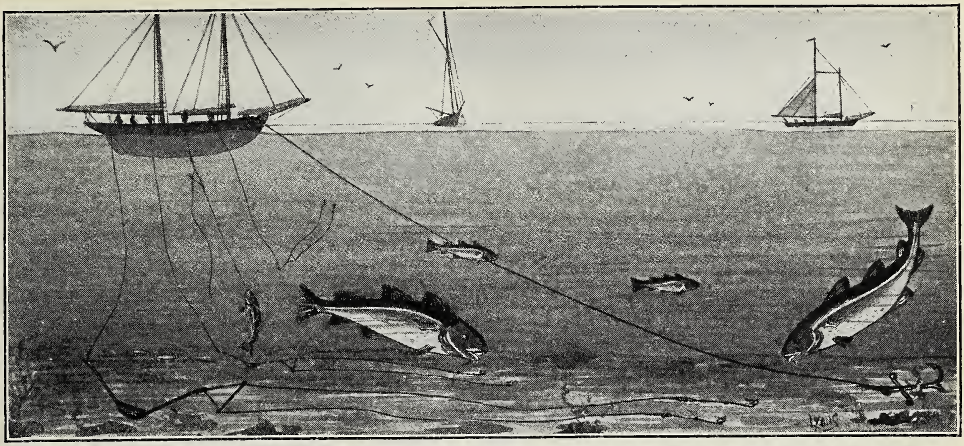


Fig. A. Inshore fishing for cod. After you have read this page, tell what the fishermen are doing.

FISHING FOR COD

After Sam has learned to sail his boat about the harbor, his father lets him go with him to catch cod. First they go on what is called inshore fishing. They go in a boat like the boats in Figure 159-A. They sail out for an hour or two beyond the lighthouse, catch fish for half a day, and come home at night. The water here is shallow, and they use hooks and lines to catch the codfish that swim along near the bottom.

Sam likes inshore fishing, but he wants to go in the *Hester* on a big fishing trip. He wants to go cod fishing out on the banks (fishing banks). Fishing banks are shallow places out in the ocean, so shallow that people can drop a baited hook over the side of the boat and catch the fish as they swim near the bottom.

After Sam had learned to sail his little boat well, his father let him go on a trip to the banks. Sam thought it was great fun to be sailing away on a five days' journey and to be out of sight of land. He liked to go down the little stairway from the deck to the small cabin and sleep in one of the top bunks. This was what his father and grandfather and great-grandfather and great great-grandfather had been doing for three hundred years.

It took them five days to reach the banks, which are not far from the island of Newfoundland. They dropped the anchor overboard and took in the sails. This was to be their home for two weeks. There was a nest of little boats, called *dories,* on the deck of the schooner. A dory was put overboard; two men got into her and rowed out a little distance from the schooner. Here they dropped overboard one end of a trawl line. A trawl line is a heavy cord about half a mile long. It is carried coiled up in a tub at the front of the dory. Short lines, two feet in length, are tied fast to the

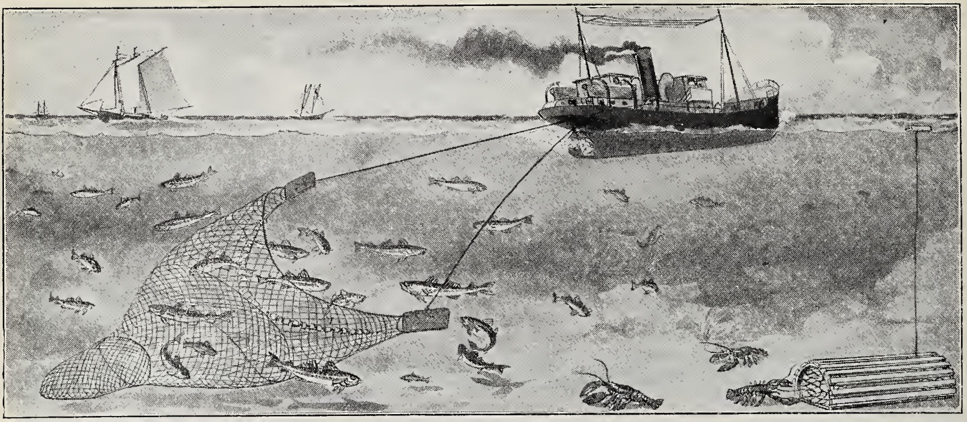


Fig. A. The modern way of fishing for cod on the Newfoundland banks. The boat is a *steam trawler*. Its powerful engines draw a wide open net along the sea bottom.

trawl at every six feet. These short lines have baited hooks on the end. The hooks swing in the water near the bottom and catch the codfish. Near each end of the trawl is a weight to make the line sink and a float to show where it is. One of the two men in the dory rows the boat, and the other throws the line over the end of the boat until it is all out. Then with their little boat tossing over the waves, they row back to the other end of the trawl, pull it up, and begin to take off the fish and bait the hooks again. When they have a dory load of fish, they go back to the schooner, where other men clean the fish, wash them clean in sea water, and pack them down in sea salt.

Nowadays many steam trawlers go out for cod on the Newfoundland banks. The trawler pulls a wide open net, called a *trawl net,* close to the bottom of the sea. (Fig. 160-A.)

Cod fishing is a dangerous business, especially on the Newfoundland banks. This is a place where two ocean currents meet. A current comes from the north, from Labrador and Eskimo Land. It brings the icebergs and the cold water. We read about that in the chapter about the North Lands. There is also a warm current that comes from the south. It comes from near the Amazon. Sometimes the boat will be in warm water, sometimes in cold water. The air over the warm water will be warm. The wind blows it over the cold water. There it does just what the steam from a teakettle does when it comes out into a cool room. Moisture in steam turns into fog. Sometimes when the men are out in the dories fishing, thick clouds of fog settle over the cold sea more quickly than showers of rain fall down on us on land. In the thick fog where one cannot see fifty feet, the men in the dories sometimes miss their way.

Fig. A. The white objects which you see on the frames in the picture are pieces of codfish. They are drying in the open air at Gloucester.

Fig. B. A fishing fleet at anchor off the coast of Norway.

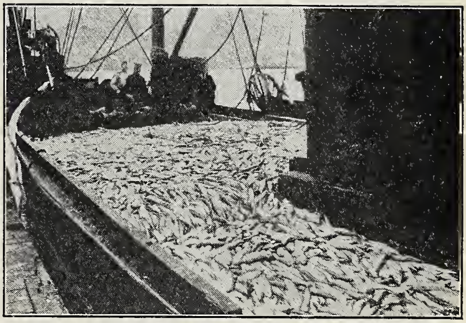


Fig C. A catch of herring off the coast of Norway.

Then they miss the schooner and their little boats drift out to sea. Sometimes great storms come up and upset the dories. Storms may even upset the schooners or drive them against the rocky coast, and the men may be drowned. The sea is very changeable and often it is cruel, but it charms men, and they love it. On Sam's trip there is nothing worse than a great storm. The waves went across the deck of the boat, but no one was hurt.

When they reach Gloucester the fish are unloaded and washed in fresh water to take off all the salt that is on the outside of them. They are now spread out on frames to dry.

Fig. A. In the picture at the left, Gloucester men are skinning fish. In the picture at the right, you see a few of the thousands of herring, or bloaters, which are hanging in this smokehouse for curing.

After this they go to the skinning sheds, where men or women with sharp knives skin them and take off the fins. They are now ready to sell. They are about as hard as pine boards and will keep almost as well. Dried codfish will keep for a year in a store in a warm country where fresh fish would spoil in an afternoon.

Many kinds of fish come into Gloucester harbor. The inner harbor north of the little island often smells of fish. There are drying racks, there are skinning lofts, pickling sheds, fish-smoking houses, canning factories. The fish are sold in barrels, in kegs, in boxes, in paper cartons. They are sold salted, they are sold pickled, they are sold fresh. Some as hard as bones are sent away by mail frozen.

The heads, skins, fins, and bones are boiled to make glue, and what is left after the glue is taken out is ground up for chicken feed or made into fertilizer. The fishermen of Gloucester can now catch more fish than ever before, because most of them have motors in their fishing boats to help them when the wind does not suit.

THINGS TO DO OR TO THINK ABOUT

1. Make a sketch map of the shore of the United States from Boston to Norfolk. On it, name and locate the places mentioned in these fishing trips.
2. Try to find pictures of the different kinds of boats that we have just read about. Make a chart of these boats. Maybe some of the boys would like to try to make models of some of the sailing schooners.
3. Make a chart of pictures to show the kinds of sea food the New England people give themselves and us.
4. Would you rather go fishing with the Eskimos, the Fur Trapper Indians, or with Sam Lawrence's father? Which would be the most dangerous? What big animals that live mostly in the water do the Eskimos use? Are these animals fish?
5. Here are the titles for some talks:
   (*a*) Deep-Sea Cod Fishing.
   (*b*) Workers in Gloucester Harbor.
   (*c*) Preparing Cod for Market.
6. Make a drawing that will explain about ocean currents and the fogs near Newfoundland.

FISHERMEN, SHIPBUILDERS, AND TRADERS

The Gloucester fisherman needs to be brave and industrious. His is rough work. It is hard work. It is dangerous work. The sea along this part of our country is a very stormy sea. Fierce winds blow, the waves dash high, the fogs are thick, and the ships are sometimes lost at sea or beaten to pieces by storm waves on the rocky coast. There is many an orphan on the fishing coasts. Sometimes the ships go down with all on board. There are many widows on the fishing coasts. In some places the people hold a meeting on a certain day in the fall, when the names are read of all those lost at sea during the year. The people throw flowers into the sea, for that is where their loved ones were buried when the ships went down.

For several hundred miles along the coast of this part of North America the shore is high and rocky like that of Gloucester, and full of little bays that make good harbors. Along this part of the coast are many towns where people live and catch fish, which they salt and sell very much as do the people in Gloucester.

The business is now not quite so dangerous as it once was, because many of the schooners now have small engines in them. When one gets into a storm, the engine is a great help in reaching a place of safety.

You can easily guess that building boats has been one of the things that men have done in the harbors of fishing towns.

Fig. A. A monument in the city of Gloucester to "They that go down to the sea in ships."

Long ago, in the time when the kings of England ruled our country, these fishermen would load their boats with salt fish and sail away to sell them on the coast of Virginia, where the codfish is not found. They also took longer trips. They went to the West India Islands and brought back hogsheads of sugar and molasses. They even sailed to the Amazon country and to Europe. Then they built bigger ships. The forests along this coast had fine timber, and the people were very careful

Fig. A. Because Gloucester uses so many fishing schooners, it has become a busy shipbuilding city.

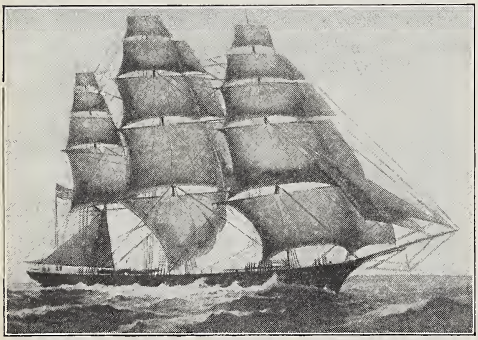


Fig. B. One of the famous clipper ships.

to save the good, straight trees for masts. These bigger ships were called clipper ships. They were the fastest sailing vessels in the world at that time, and men from Gloucester and other fishing towns sailed with them all the way around the south point of Africa. They went even to India, China, and the Dutch East Indies. Your teacher will show you on the globe how they went. They brought back cargoes of tea and spices, and, with these products, the people of Gloucester and other fishing towns became great traders in the colonial times after our Revolutionary War. I know of one family in Gloucester that had seven sons, all of whom sailed in ships going out to eastern Asia about 1825.

These clipper ships are not built now. The steamship driven by an engine run by coal or oil now does the work that the clipper ships did. The large steamers need deep harbors. Therefore they do not come to Gloucester and many smaller towns that had the clipper ships.

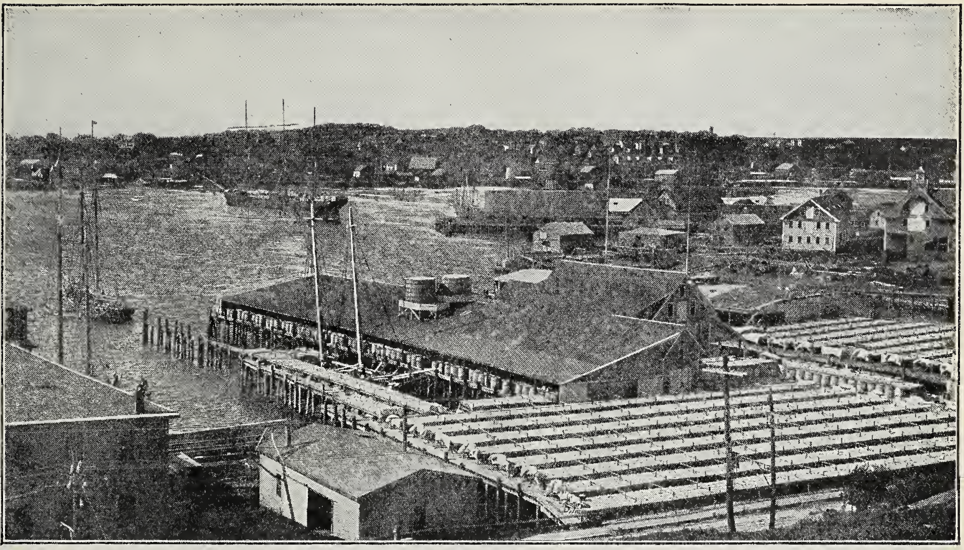


Fig. A. A harbor on the coast of Newfoundland. See the long racks for drying cod. A ship, loaded with fish, is sailing away from the warehouse. See the schooner by the warehouse and the barrels of fish.

EARLY FISHERMEN AND THE NEWFOUNDLANDERS

The people of Gloucester were not the first fishermen in the world, by any means. You remember that we read about the fishermen of Holland. They were catching fish in the ocean near Holland before Columbus sailed to America. So were the people of England, and for a long time the people of Europe thought the most important thing about the discovery of America was the fishing banks off the coast of Newfoundland where the Gloucester and Newfoundland fishermen go.

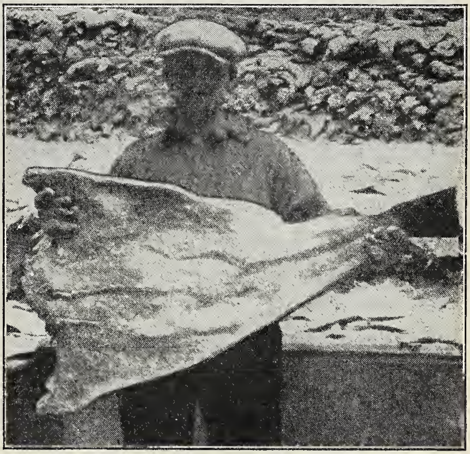


Fig. B. This codfish has been cleaned and is ready for drying. Compare its size with the man.

A few years after Columbus discovered America, the fishing boats of England and France sailed all the way across the Atlantic to fish on the banks of Newfoundland, and then sailed back taking the fish to Europe. This they did for years and years before anyone from Europe settled on the coast of North America.

The people of Newfoundland live near the Grand Banks.

Fig. A. This picture gives you a very good idea of a fiord in Norway. What are the fishermen doing?

NORWAY AND THE NORSEMEN

Long before the time of Columbus, the greatest fishermen of all Europe were the people of Norway. In those days they were called Norsemen. Their coast had many long, deep bays with high, rocky shores and deep water. Such bays are called *fiords*. (Fig. 166-A.) Fiords are splendid harbors, but the land along them is so steep that very little of it is good for farms. What could the poor Norwegians do? About all they had were harbors, little garden patches, a few pastures, and steep hills with stout trees upon them; so after they had made farms on the little bit of land that was good for farms, they used their trees for building ships. Then they sailed away to catch fish. The cool climate of their country made them feel like working. They are today a very industrious people.

We should not care to go to sea in a Norse boat (see Fig. 167-B), but the Norsemen were brave sailors. In their little ships they sailed across the ocean to Iceland and settled there. They sailed on to Greenland and settled there, and they sailed to Labrador and on to a place which they called Vineland. They called it Vineland because they found wild grapevines there. They were very much excited about this grapevine country. They went back to Greenland and to Iceland

and to Norway telling stories about Vineland, but no one knows where Vineland was, for they did not stay long.

To this day the people of Norway catch fish, load them in their boats, sail away to other countries, and sell them. The Norwegians are great sailors. They build many ships and carry freight for other people. It is almost certain that in some of the stores where your father and mother buy things for you, there are things which were brought across the sea in Norwegian ships. There are Norwegian ships in New York harbor every day in the year. If you will look through the magazines, you may find an advertisement of something that comes from Norway and other places where codfish are caught. It is cod-liver oil. Many people use it as medicine.

Fig. A. The long, deep, narrow fiords of the Norway coast enable boats to bring their freight far inland. Does this country look good for farming?

Fig. B. In ships like the one in this picture the Norsemen sailed all the way from Norway to the coasts of North America. This was before Columbus discovered our continent.

THINGS TO DO OR TO THINK ABOUT

1. Make sand-table models of these "land forms," as we call them:
   (*a*) peninsula (*b*) cape
2. Make drawings to show the difference between a bay and a fiord.
3. Make a sketch of a good harbor that will show why it is a good harbor.
4. Make a large map that will show Newfoundland, Greenland, Iceland, Norway, Gloucester, the Atlantic Ocean, the arctic circle.
5. Is there any place in Norway where the horizon might look as it did in Eskimo Land at midnight? If so, why is this true? If not, why not?
6. Look carefully at a map of New England. Then look just as carefully at a map showing the coast near Atlantic City. Which of these two coasts would have more good harbors? What makes you think so?
7. Here are some more play titles:
   (*a*) The Old Norsemen. (Your teacher will read you some stories about them. Why are so many of these stories about the sea?)
   (*b*) The Norwegians of Today.
   (*c*) How the Newfoundland People Make a Living.
8. Why do many people in New England and Norway help to build ships? Why do many of them sail the sea?
9. If a Norwegian ship came to this country, what are some of the things that the Norwegians might buy and take back to Norway?

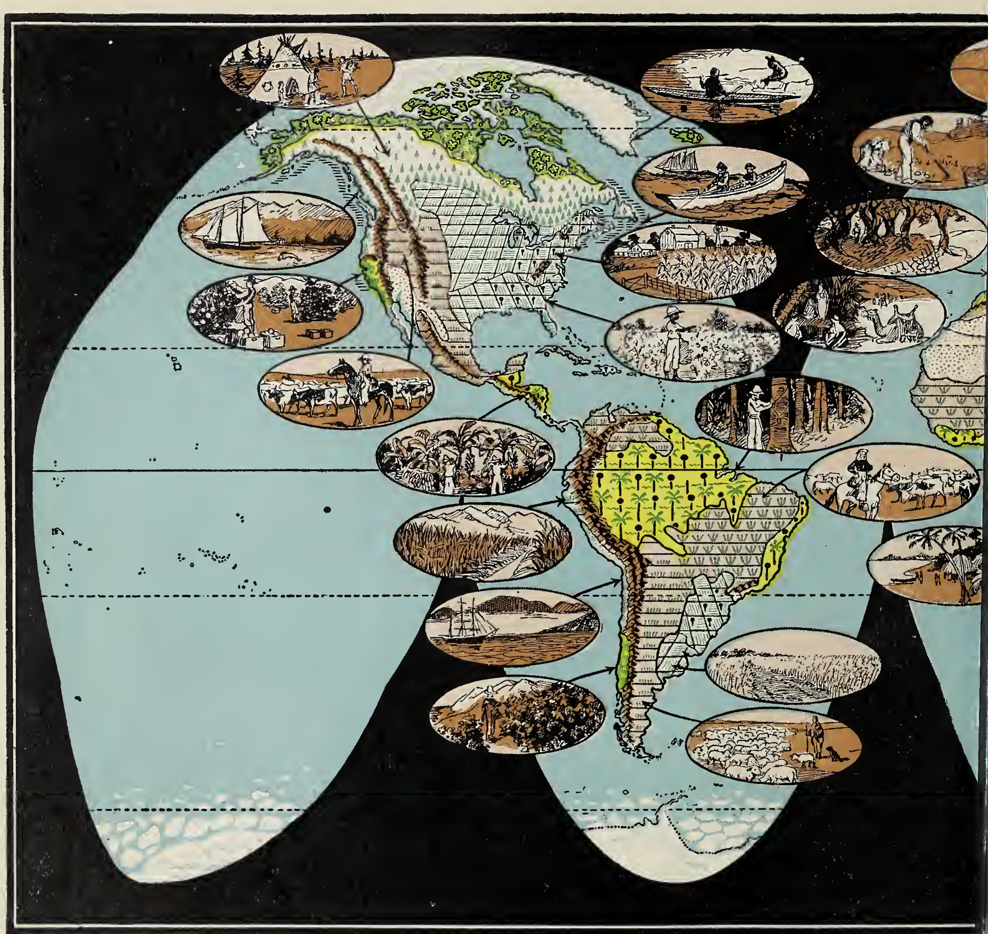
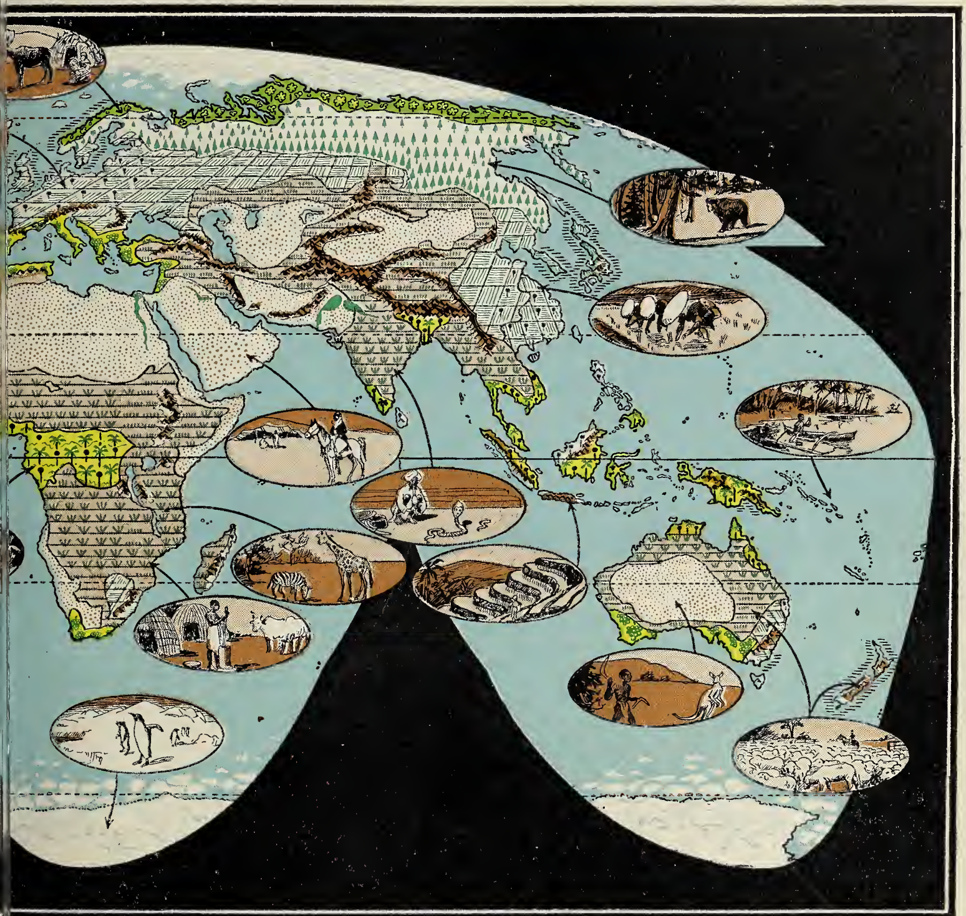


Fig. A. The World

The pictures below and the little stories after each picture are called a *key*. They will help you to unlock the meaning of the map. Look carefully at each picture; read the story about the picture; then find as many samples as you can of the same kind of land on the map as in the picture.

- The ice caps—lands of ice and icy water.
- The far cold north—lands of the Eskimo and of the Laplander.
- The cold forest country—home of the fur trappers.
- Seacoasts rich in fish.
- Farmlands with frosty winters.
- Lands with long, warm, wet summers.
- Lands with dry summers—the Mediterranean climate.
- Grasslands with cold winters.
  Hot grasslands with dry summers.
- Dry lands.
- Wet, hot forest lands.
- Desert lands made rich by rivers.
- High mountain lands.



is the Home of Man.

As nearly as we could do it, this map has been made to look like a picture of the land in each part of the world. The little green pine trees show forested lands. The little bunches of grass show lands that are covered with grass. The little fields show farmlands. The pictures in the ovals show only one or two of the many things which are to be seen in the different kinds of lands.

Point on the map to the land near your home. In how many other parts of the world do you find lands that are like it? Point to a land which you would like to visit as a traveler; as an explorer. Suppose you had to move to another part of the world to live, where would you choose to go and why? Point to parts of the world which your father might visit were he a salesman for plows; were he a fur buyer. Suppose the penguin, in one of the ovals, had to move away to a distant part of the world. Where would he go if he knew as much about the world as you do? Would the giraffe and the penguin like to exchange homes with each other?

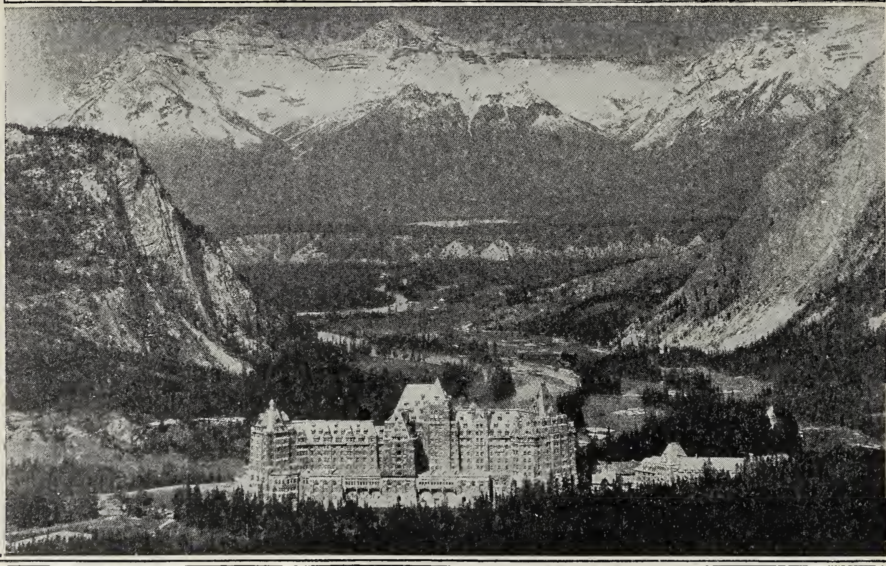


Fig. A. A sample of mountain lands and of how mountains help people. High up are the snow fields and glaciers which supply the valley stream with water in which man may fish and from which he may take water for irrigation. Below the snow are the forests for lumbering. Where the scenery is very beautiful, as in this picture, men build summer-resort hotels for people from the hot cities.

THE BIG IDEA—THE SAMPLES AND THE WORLD

STUDYING BY SAMPLES

Do you know what a sample is? Perhaps someone can bring to class a sample of cloth, linoleum, or paper and explain why people give one another samples of things. In this book we have been learning geography by taking samples of different kinds of places in the world. That is why we have skipped about the world a great deal, from *near to far*, from *hot to cold*, from *wet* to *dry*, from *low* to *high*. Perhaps you can name a place or a chapter or a part of a chapter which comes to your mind as you think of each of these words.

As you read this chapter, ask yourself at the beginning of every section: Where is the sample? What is the sample like? Where are other places like the sample?

Each place that we have studied is a sample of other places in other continents that are very much like it. We will now find some of these other places that are like the samples which we have studied.

Fig. A. A sample of the wet, hot forest lands where the banana grows.

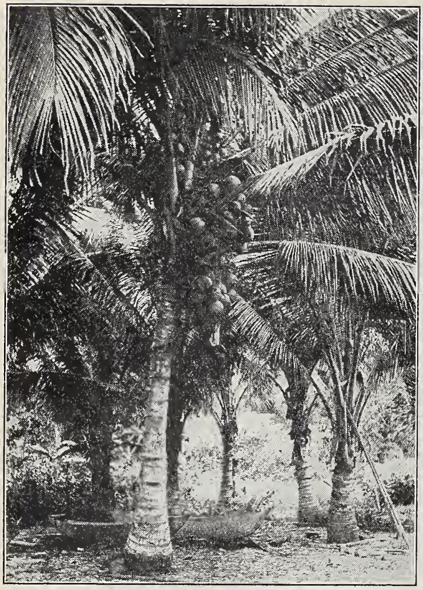
THE WET, HOT FOREST LANDS

We found in the chapter on the Amazon Basin (page 34) that land in this great river valley is covered with very thick forest. This forest is leafy and green all the year, as is always the case with forests in lands that are hot all the time and wet most of the time.

Nearly all of the land on both sides of the equator has these wet, hot forests. The map (Fig. 168-A) shows a large area of it in South America, another large area in Africa, some in Asia, and more of it in many large islands that lie between Asia and Australia. The map (Fig. 178-A) will help you to find the names of two or three of these big, forested islands.

If you look again at the map (Fig. 168-A), you will see that there is some of this forested land also on the shore of the southern part of North America.

What do people eat in these forest countries? One of the things you, too, have doubtless eaten is the banana (Fig. 171-A). Since man has learned to run steamships very rapidly and keep them cool inside, he can now bring bananas from the wet, hot country where there is never any frost to lands as far away as our own country and Europe, where there is so much frost that no banana plant can live more than a few months. Figure 171-A shows a banana plantation in the southern part of North America, which is called Central America. Perhaps you can look at the world



Figs. A-B. The picture above is a sample of the rubber plantations which are found in southeastern Asia. The picture at the left is a sample of the coconut palm which grows in all hot, wet lands. See the large cluster of coconuts on the tree.

map and tell why you think it got its name of Central America.

In the forests in the hot, wet lands are many kinds of trees bearing many kinds of fruits and nuts that are good to eat, good for birds, monkeys, and other wild animals, as well as for man. One of these nut-bearing trees gives us a food which nearly every schoolboy and girl in the United States has seen. We can buy some of it in almost any candy store (Fig. 172-A). This tree grows in every continent and on every large island that has the wet, hot forests. The coconut tree is very useful to the people who live in those countries, as you shall learn in a later grade.

In telling about the Amazon, we learned how men get a useful product from another tree. It is not a food. It stretches and does many other useful things.

How many uses can you name for rubber? The rubber tree has been taken about the world and planted by men in very much the same way that they have carried sheep from one continent to another. The wild rubber tree that grew in the Amazon Basin has been planted on the Malay Peninsula, that is the most southern peninsula of Asia. Rubber trees from the Amazon have also been planted on Ceylon, an island just south of India, and on the three big islands nearest to the southernmost peninsula of Asia.

Men from England, men from China, men from the United States have gone out to these distant lands to be managers of the rubber plantations. Perhaps you have seen and used rubber that came from the very trees shown in Figure 172-B.

Fig. A. A sample of Eskimo Land and of Lapland during the short summer. In winter this land is covered with snow. What animals do you see in the picture?

THE FAR COLD NORTH AND THE FAR COLD SOUTH

In our study of samples of the earth's surface, we have gone from the hot, wet forests to the iciest places in the world, to the home of the Eskimo, the polar bear, and the seal, and to the ice caps of Greenland and Antarctica. The Eskimo we met in the chapter beginning on page 56 lives in the northern part of North America, but other continents have the same kind of climate, the same kind of plants, and the same kind of animals, and men who must live in very much the same way because they live in the same kind of place. What continents show land that bears the same mark as that which is found on Eskimo Land? What is the great difference in the way the Laplander and the Eskimo make their living (pages 69-71)?

Look at the map (page 168) and see if you can answer this: Would you expect the men in the part of Asia that is nearest to Lapland to live as do the Laplanders or as do the Eskimos of America? From which group would it be easier for the men of Lapland to learn new ideas and ways of doing things? Would it be easier for them to get animals from their neighbors in Asia or from their Eskimo neighbors?

A great thing happened to some of the Eskimos not long ago. Some foreign school-teachers went to the Far North and taught them a new art. These new school-teachers were Laplanders. They brought herds of tamed reindeer from their own country to the land of the Eskimos. They lived for years with the Eskimos and taught them how to take care of reindeer. The herds of reindeer are now increasing from year to year. Their meat is good to eat, and their skins make warm clothes. Tell what difference this will make to the Eskimos.

Fig. A. A sample of most of Greenland and most of Antarctica. The birds in the picture are penguins.

THE ICE CAPS

What do most of Greenland and most of Antarctica look like, both summer and winter (Figs. 22-A and 23-A)? What can an animal find there to eat? Men do not want to live in the antarctic regions, but the penguin is able to live in this land of ice and ice water. When you have finished reading this, tell how the penguin is like the seal. The penguin is a funny bird. There are many kinds of penguins. Some are nearly three feet high, but their wings are not much larger than a child's arm. Of course they cannot fly, but they are wonderful swimmers. A penguin is perfectly at home on the ice cakes in the Antarctic Ocean. He will plunge into the icy water, and with his feet and his little wings he will swim under the water almost like a fish. Indeed, he swims so fast that he can catch fish! He lives upon fish, and fish can live in ice water because there are tiny plants living in the ice water, and tiny fish live on these little plants. Penguins have lived in Antarctica for hundreds of years without ever seeing a man. They have not learned to be afraid of man as other wild creatures are, so they do not fear a man any more than you fear a fence. The explorers have a very interesting time playing with them and laughing at them because they are such funny, dignified birds. They look very conceited. They stick out their chests and strut and make you think that they think themselves the smartest fellows in the world.

There are explorers on the Antarctic ice cap or on the Greenland ice cap nearly all the time. They try to find out about the weather and keep a record of what happens.

THE HOT, DRY LANDS

Find on Figure 169-A the great Sahara Desert which you read about on pages 86–90. If you look closely, you will find that this desert region goes on into Asia, and that other large deserts are to be found in other continents.

The people who lived in these deserts in the other continents were not lucky enough to have the camel until white men began to take camels about the world. Page 87 tells something about camels in one of these deserts. Do you think it is a good thing or a bad thing for North America that its hot desert is much smaller than the ones we find in Asia and in Africa?

Why do you think these lands of little rain would look alike in North America, in North Africa, in South Africa, in Australia, and in Asia?

DESERT REGIONS MADE RICH BY RIVERS

The chapter on Egypt (pages 95–105) told about a country whose people sometimes call a river "Father." Why do people call Egypt "the gift of the Nile"?

What do you suppose would happen if there should be another river like the Nile that would flow out into some part of the Sahara Desert and carry water there?

Egypt is not the only country with a great river flowing into a desert. In southwestern Asia is a gulf called the Persian Gulf. Two rivers flow into it. The one to the west is named Euphrates. The one to the east, with the city of Baghdad upon it, is called the Tigris. These two rivers are like the Nile. They, too, flow into a desert from mountains where much rain falls, and, like the Nile, they have fed irrigation canals for a long, long time. These irrigation canals have carried water to the fields, and the fields have made crops that fed many people who lived in the great oasis called Mesopotamia — a word that means "the land between two rivers."

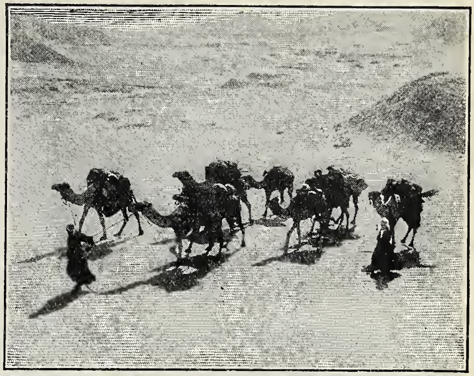


Fig. A. A sample of the hot, dry lands of the earth. The camels are crossing a part of the Sahara.

A long time ago there was a city here, named Babylon, and another named Nineveh. Perhaps your teacher will tell you about them. They are mentioned in the Bible.

When you study more geography you will learn about two other great rivers that flow into deserts: one in India is named the Indus; one in the United States is named the Colorado. Perhaps you can find them on the map (Figs. 168-A and 169-A).

Fig. A. A sample of farming lands which have warm summers and frosty winters. The windmill tells you that this picture was taken in Holland.

THE GREAT FARM REGIONS WITH FROSTY WINTERS

The map (Fig. 168-A and 169-A) shows a large area of this good farm land in North America, and two large areas of it in Europe and Asia. Find smaller areas in other continents that have the mark which shows that they are the same kind of land.

You will notice that Holland (pages 133–150) is in this great area of good farm land with frosty winters. This land of grain and forests is a very important part of the world. In our own North America it is the home of more than half the people in the whole continent. When we study Europe we shall see that there are many nations whose land is all in the great belt of the earth having this frosty-winter-and-warm-summer kind of farm climate.

Find on Figure 168-A and 169-A the great farm lands of the world which have long, warm, wet summers. Notice that these farm lands border the farm lands with frosty winters but are closer to the equator.

LIFE IN THE MOUNTAINS

What is the great difference one sees in looking at the land in Holland and in Switzerland? You can get the answer to this question by looking at all the pictures in the chapters beginning on pages 107 and 133.

In the chapter on Switzerland, we learned many things about how men live in high mountains. There are many other high mountains in the world. Perhaps your teacher will help you find the Pyrenees Mountains, the Caucasus Mountains, and the mountains of Scandinavia (Figs. 108-A and 110-A). Now find these same mountains on the globe (page 17, B-D). Can you also find the Rocky Mountains of North America,

the Andes Mountains of South America, and the Himalaya Mountains of Asia?

What does Figure 115-A show you about the things that man can do in mountains? Can you find anything in Figure 115-A that reminds you of something in Figure 170-A? We will learn more about all these mountains as we study other books in geography.

COAST PEOPLES AND FISH

Name two or three important things about seacoast peoples (pages 151–167). Find on the map (Fig. 168-A) the coasts that are the homes of the people mentioned in this chapter. On the same map you will see that there are similar coasts on the western side of North America and on the eastern side of Asia. If there had been space, we could have told many things about how the people of Japan go out to sea to catch fish, and how the people on the western coast of North America do the same.

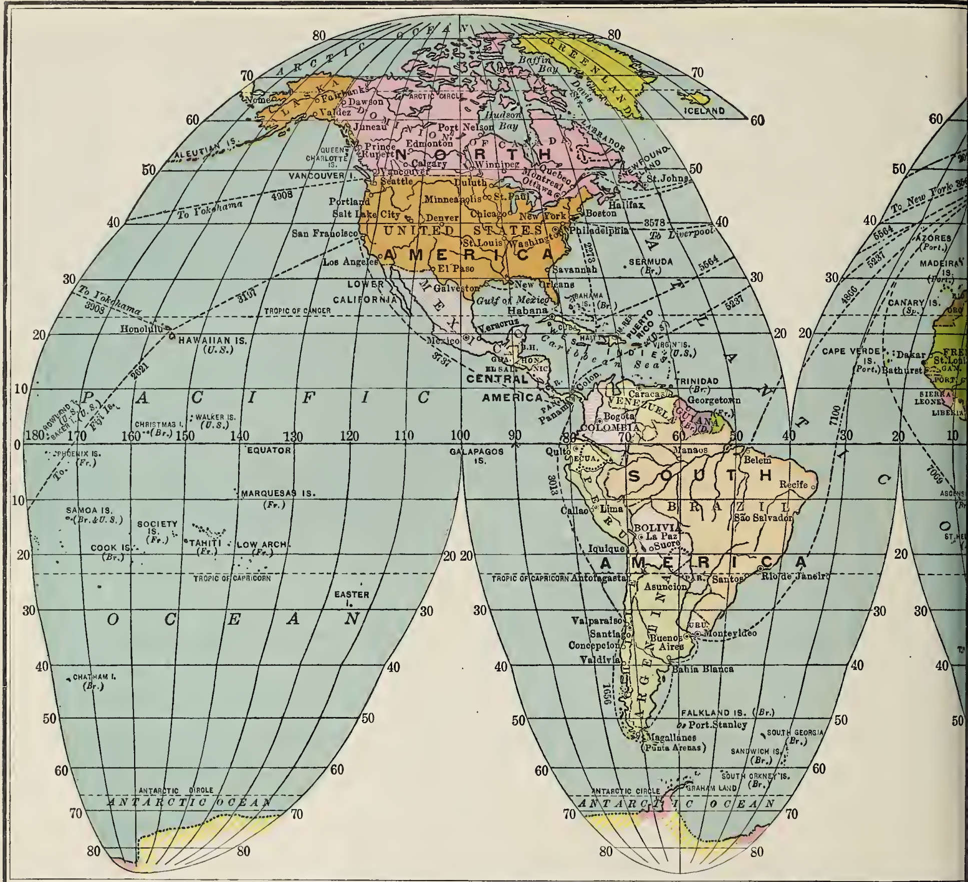
OTHER SAMPLES

The map (Fig. 168-A and 169-A) shows that the world has several large samples of land other than the samples which we have studied. The first of these is the cold forest country—the home of the fur trappers and lumbermen. It covers a very large area in northern North America, northern Europe, and northern Asia. It is shown on pages 168–169 by means of small green trees.

Fig. A. A sample of the cold evergreen forest lands of the earth. This picture was taken in northern Europe.

The second big sample of land which we have not studied is the lands with dry summers and mild, rainy winters — the Mediterranean climate. These lands are located on Figure 168-A and 169-A by means of small bunches of grapes — a very good symbol indeed, for these lands produce grapes and other fruits, olives, and wheat. The largest area of these lands of dry summers is the Mediterranean countries of Europe, Asia, and Africa. Find lands with Mediterranean climate in each of the other continents (Fig. 168-A, 169-A).

The third big sample of land is the grass lands. These are shown on Figure 168-A and 169-A by tufts of green grass. Some of these grass land areas are hot with dry summers. They are found border-



POLITICAL MAP

OF

THE WORLD

ON GOODE'S HOMOLOSINE EQUAL AREA PROJECTION

Distances shown in statute miles

SCALE OF MILES

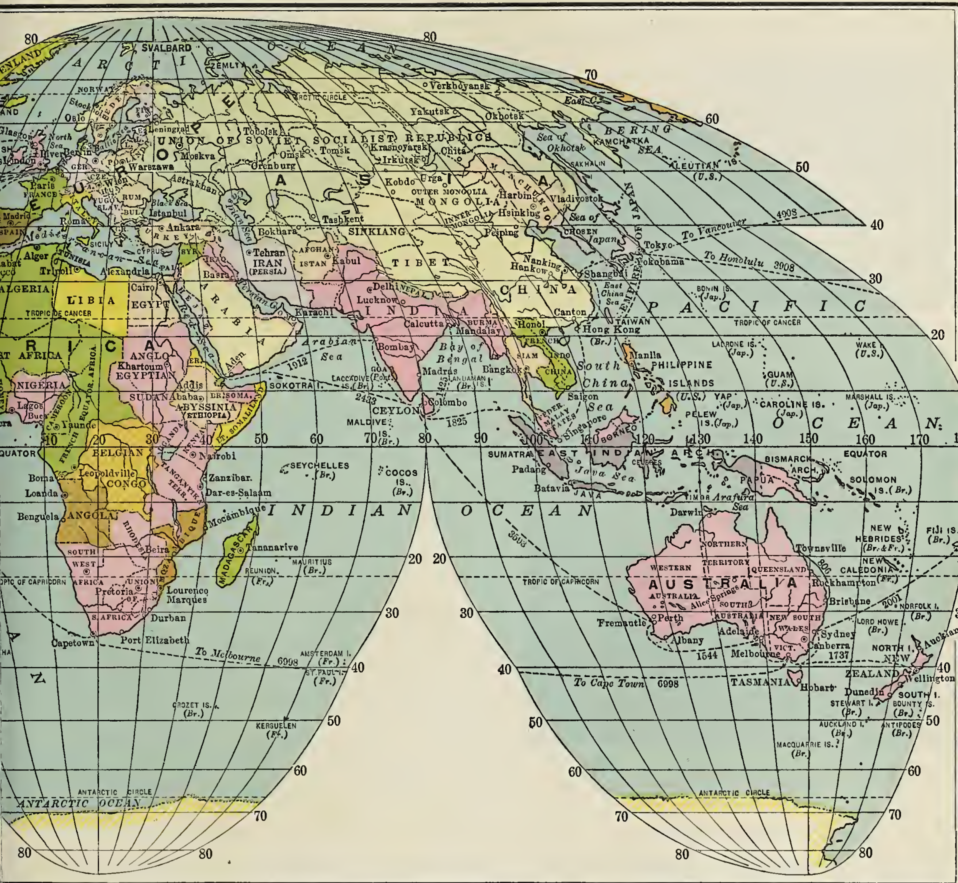
0 500 1000 1500 2000 2500 3000

COLONIAL POSSESSIONS

United States	*Portugal*
Great Britain	*Spain*
France	*Netherlands*
Italy	*Denmark*
Belgium	

The Homolosine projection by Professor John Paul Goode is an equal area projection; that is, a square inch anywhere on the map represents the same number of square miles of the earth's surface as any other square inch on the map. For this reason areas of countries may be shown upon it without error. The continents are given better form than in any other world map projection. It is greatly superior to Mercator's projection for nearly all teaching purposes.

Fig. A



The world is round, like an orange. Maps are flat, like sheets of paper. How can we show the surface of the round globe on the flat map? That is a hard problem.

The best way to get an idea of this problem is to skin an orange carefully in one piece and spread the skin out flat like the one shown here.

It is not hard to do. It shows you how the surface of a globe looks when spread out flat.

Professor J. Paul Goode did something like that with the skin of a globe when he made this map. He has stretched it a little to get it flat, but this map shows all the different countries and continents in true relative size, and more nearly in their true shape than any other flat map of the whole world shows them. That is why we use it here. It is the truest map there is—of the whole world—on one sheet.

Fig. A

Fig. A. A sample of lands which have enough rain for grass but not enough for trees. These lands are used for pastures for sheep, cattle, and other animals. The picture was taken on the Great Plains of our own country.

Fig. A. A sample of pasture lands in Asia. The Kirghiz in the picture are milking a sheep.

ing the wet, hot forests. The remaining grassland areas of the world are grass lands with cold winters. Find these grassland areas in each continent. They are the great grazing lands of the world.

All these grass lands have enough rain for grass but not enough for forests. A few trees grow along the streams. Flocks of sheep, herds of cattle, and other animals eat the grass.

THE GEOGRAPHY YARDSTICK

How long is a piece of cloth? Have you ever seen a salesman in a store measure off cloth with a yardstick to see how long it was? This book has given you some yardsticks — some geographic yardsticks — with which you can take the measure of land. You hear of a new place. Think how many things you know about it if someone tells you that it is in a country like Eskimo Land, or like the Amazon Valley, or like the Swiss Mountain lands, or like the Sahara, or that it is in high mountains. With these yardsticks you can learn geography more easily.

THE GRAND CANYON OF THE COLORADO RIVER

Fig. A. The four travelers in this picture with their guide have been down to the bottom of the Grand Canyon of the Colorado River in Arizona. They are winding their way up the narrow path to the rim of the canyon. The layers of many-colored rocks—pale buffs and grays, delicate greens and pinks, dull reds, chocolate browns, slate grays, and other colors—in the canyon walls, lit by the afternoon sun against the deep blue of the sky, form one of the most beautiful views to be found anywhere in the world. In some places this canyon is more than a mile deep. At its bottom is the Colorado River busily at work wearing away the rocks, carrying away the particles, and making the canyon still deeper. The most beautiful section of the canyon has been set aside by our government as Grand Canyon National Park.

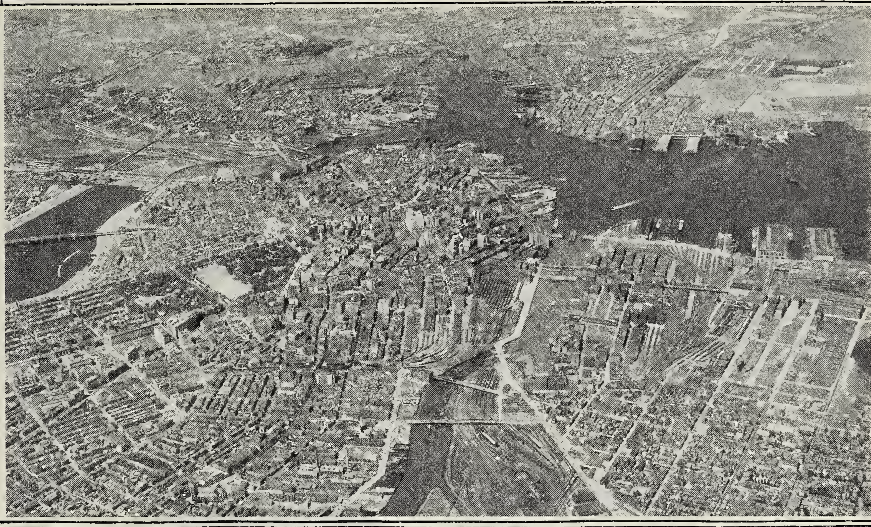


Fig. A. A part of the city of Boston as seen from an airplane.

CROSSING OUR COUNTRY FROM EAST TO WEST

No

BOSTON TO NEW YORK BY THE BOSTON POST ROAD

We are going to take a wonderful *make-believe* trip. Some day, when we take the *real* trip, we shall have a camera. So now, while we are traveling make-believe, we are going to make a list of all the scenes which we want to snap on our real trip. Our list of pictures will show all the different kinds of country we have seen and the different ways in which people make their living in each.

An old road made new. Let us imagine that we are crossing the United States from ocean to ocean in an automobile early in June. We shall start from Boston and follow the Boston Post Road to New York. Before there were automobiles or trains in our country, stagecoaches (Fig. 240-A) carried passengers and mail over the old Post Road between Boston and New York. In that day most of the few roads were very bad indeed. The first stagecoaches on the Boston Post Road bumped over ruts and splashed through mud puddles day after day. Sometimes it took a week to go from Boston to New York. Now the Boston Post Road is smooth and hard. Our automobile can go from Boston to New York in less than a day, with time to spare for looking at things along the way.

As we ride over the smooth, hard Boston Post Road, we should think about the hard work that our forefathers had in making their roads. It took a great deal of their time to make even a fairly good road when there was no cement or asphalt and when stone was broken with a hammer

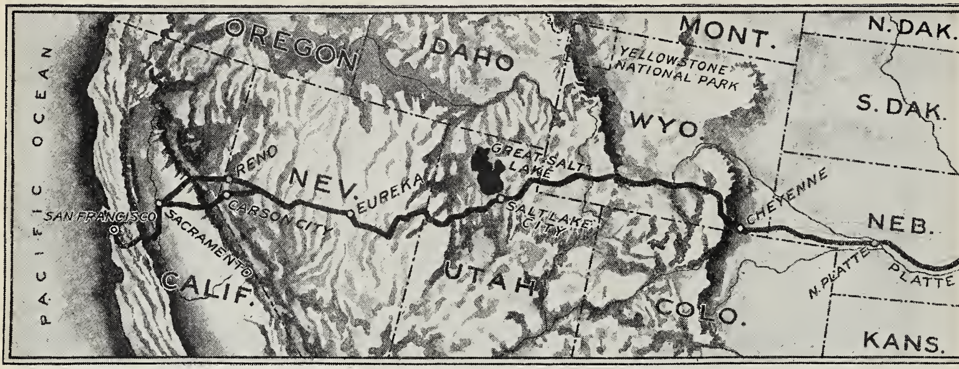


Fig. A. This drawing shows the path of the Boston Post Road from Boston to New York City, and the Lincoln passes. Name the big cities along the way. Over plains, through mountains, and across rivers and dry lands other parts of the United States.

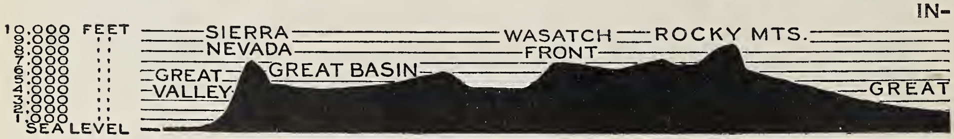


Fig. B. You have seen your mother cut a pie in two. Imagine that she had a very big knife, cut the United States thing like this drawing. It is called a *cross section.* It shows the height of the land at different places

instead of by a stone crusher, and when dirt was lifted by hand shovels instead of steam shovels.

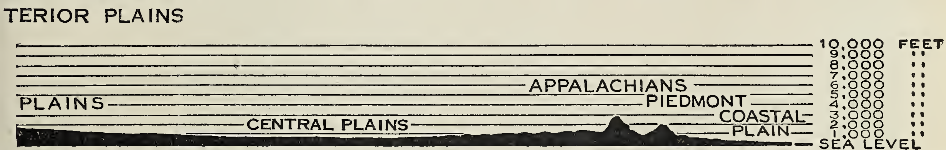
The farms. We leave Boston early in the morning and soon pass neat, white, frame farmhouses with big apple trees, pine trees, and other shade trees standing near them. In a short while we are passing land that is so rocky that a man could never make a smooth field of it unless he spent months or even years blasting stones with dynamite and hauling the pieces away. Trees stand among the stones. Most of the land between Boston and New York has trees upon it because most of it is too stony and hilly for farms, but we shall see many farms that are well cared for, although we often see many small stones in the earth.

Two kinds of towns. As we pass through a small city, we see several large buildings, with tall smokestacks, in or near the city. These are factories. This is a *manufacturing town.* Most of the people who live here work in the factories, and the things they make go to many other cities and towns, and to villages, farms, and even to foreign countries.

We pass many manufacturing towns. As we come near New York, we see that the towns here are not manufacturing towns. The people who live in these towns go by train or automobile to New York to work, and back by train or automobile to their homes in the evening. The towns where they live are called *suburbs.* Nearly all large cities have suburbs near them.

We now see more and more automobiles and trucks on the road. Our driver must be very careful indeed. At last we see in the distance the tall buildings that crowd Manhattan Island (Fig. 186-A). We drive on to the island by a bridge, for only a narrow stream separates Manhattan Island from the land to the east of it.

Highway across our country from New York to San Francisco. Name the states through which this highway this highway has been built. The map (Fig. 184-A) shows that the plains, mountains, and rivers continue on through Now look at Figure 182-B.



in two along the Lincoln Highway, and separated the two pieces. The cut edge of either piece would look some- along the highway. Find on the map (Fig. 182-A) and on Figure 184-A each thing named on the cross section

The Boston Post Road ends at New York, and there the Lincoln Highway begins. It reaches from ocean to ocean — from New York on the eastern, or Atlantic, shore of the United States to San Francisco on the western, or Pacific, shore of the United States. Our trip from coast to coast will take us over most of this long highway. We shall see that our country has many kinds of surface, soil, climate, scenery, and cities. We shall see many ways of making a living and many kinds of play and recreation.

A cross-word puzzle that reads only horizontally. Make a copy of the puzzle and fill in each blank with the proper letter.

1. The road we are following.
2. An island on which New York is built.
3. A university in New York.
4. A park in New York.
5. The highway we follow next.
6. A city at its eastern end.
7. A city at its western end.
8. An ocean at its eastern end.
9. An ocean at its western end.

1. B						P				X	X
2. M									X	X	X
3. C								X	X	X	X
4. C							X	X	X	X	X
5. L							X	X	X	X	X
6. N		Y					X	X	X	X	X
7. S		F									
8. A								X	X	X	X
9. P							X	X	X	X	X

Something to do. Make up sentences using each of the following words:

stagecoaches	factories
manufacturing town	Manhattan Island
asphalt	suburbs

Exchange papers and have one of your classmates decide whether your sentences are correct.


M N O P Q
2 3 4 5 6 7
130° 125° 120° 115° 110° 105° 100°
45° 40° 35° 30° 25°
120° 115° 110° 105° Longitude 100° West
PACIFIC OCEAN
Str. of Juan
C. Flattery
Vancouver
Victoria
Seattle
Aberdeen
Olympia
Tacoma
Mt. Rainier
Spokane
WASHINGTON
Portland
Salem
Columbia
OREGON
Boise
IDAHO
Pocatello
Butte
Helena
MONTANA
GLACIER NATIONAL PARK
Missouri R.
Yellowstone
NORTH DAKOTA
Bismarck
SOUTH DAKOTA
Pierre
BLACK HILLS
YELLOWSTONE NATIONAL PARK
WYOMING
Casper
Cheyenne
Granger
NEBRASKA
Platte R.
Mt. Shasta
Cape Mendocino
Sacramento
Sacramento R.
San Francisco
San Joaquin R.
CALIFORNIA
Reno
Carson City
NEVADA
GREAT BASIN
YOSEMITE NATIONAL PARK
SIERRA NEVADA
Mt. Whitney
Great Salt Lake
Ogden
Salt Lake City
UTAH
Denver
COLORADO
Pikes Peak
Pueblo
Kansas
KAN
Wichita
Colorado R.
GRAND CANYON
ARIZONA
Phoenix
Tucson
SANTA BARBARA
Los Angeles
ISLANDS
San Diego
Salton Sea
Santa Fe
Albuquerque
NEW MEXICO
Llano Estacado
El Paso
TEX
Edwards Plateau
Oklahoma City
OKL
San Antonio
Rio Grande
Austin
Brownsville
Gulf of California
LOWER CALIFORNIA
SIERRA MADRE
MEXICO
TROPIC OF CANCER
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Fig. A.


PHYSICAL AND POLITICAL MAP
OF THE
UNITED STATES
SCALE OF MILES
0 50 100 200 300 400
National Capitals
State Capitals
State Boundaries
International Boundaries
Railroads
REFERENCE
HEIGHT OF LAND
10000 feet
5000
2000
2000 feet
1000
500
Sea Level
Below Sea Level
(Only in S.Calif.)
Greenwich
95° 90° 85° 80° 75° 70° 65°
45° 40° 35° 30° 25°
2 3 4 5 6 7
CANADA
Lake of the Woods
Port Arthur
Lake Superior
Duluth
Minneapolis
St.Paul
WISCONSIN
MICHIGAN
Lake Michigan
Milwaukee
Madison
Lansing
Detroit
Sudbury
Georgian Bay
Lake Huron
Ottawa
Quebec
Montreal
Toronto
Lake Ontario
Buffalo
Niagara Falls
Lake Erie
Sioux City
IOWA
Des Moines
Chicago
Toledo
Cleveland
PENNSYLVANIA
Harrisburg
Pittsburgh
OHIO
Columbus
ILLINOIS
Keokuk
Springfield
INDIANA
Indianapolis
Cincinnati
Kansas City
Jefferson City
MISSOURI
St.Louis
Frankfort
Louisville
KENTUCKY
WEST VIRGINIA
Charleston
WASHINGTON
VIRGINIA
Richmond
Norfolk
OZARK PLATEAU AND MOUNTAINS
Fort Smith
Little Rock
ARKANSAS
Texarkana
Nashville
TENNESSEE
Memphis
Chattanooga
Mt.Mitchell
NORTH CAROLINA
Raleigh
Cape Hatteras
Cape Lookout
Wilmington
Cape Fear
SOUTH CAROLINA
Columbia
Charleston
Atlanta
Birmingham
ALABAMA
GEORGIA
Montgomery
Savannah
MISSISSIPPI
Meridian
Jackson
LOUISIANA
Shreveport
Baton Rouge
New Orleans
Mobile
Pensacola
Tallahassee
Jacksonville
St.Augustine
FLORIDA
Tampa
Miami
Cape Sable
Key West
Galveston
GULF OF MEXICO
MAINE
Augusta
Portland
Montpelier
NEW HAMPSHIRE
Concord
Gloucester
Boston
Cape Cod
MASS.
Providence
CONN.
Hartford
Albany
NEW YORK
New York
NEW JERSEY
Trenton
Philadelphia
Atlantic City
Baltimore
Annapolis
Delaware Bay
Chesapeake Bay
ATLANTIC OCEAN
BAHAMA ISLANDS
TROPIC OF CANCER

Fig. A

HU-1

Fig. A. As our ferryboat is crossing the Hudson River from Manhattan to Jersey City, we look back and see the tall buildings of lower Manhattan. They form a part of what is called the *sky line* of New York City. Point out on each picture in Figure 187-A the place from which you think this picture was taken.

NEW YORK TO PHILADELPHIA BY WAY OF ATLANTIC CITY

Crossing a large river. We start early in the morning from New York City. The streets are full of automobiles and trucks, and our car must go very slowly. We might get across the river that is west of Manhattan Island by going through a great tunnel that men have built far down beneath the river (Fig. 404-A). We choose, instead, to go in a ferryboat because we can see more. We turn aside and drive through a wide doorway into a long building. At the other side of the building is the Hudson River. We drive right on the boat, with many other automobiles and many trucks. The boatmen fasten an iron gate at the end of the boat in front of the automobiles; the engine starts and the boat moves slowly out into the river. We look back and see the tall buildings of the city. This view thrills every traveler who sees it. Many visitors photograph this famous group of the giants of lower Manhattan.

New York has many, many thousands of people. That is why we say it has a large population. Can you think of reasons why the buildings are so high?

Port and harbor. We say that New York has a *harbor* because the big ships can come in there from the ocean and lie in quiet water. We call a harbor a *port* if vessels load and unload freight there. If they are ocean vessels, we call the port a *seaport.*

As our ferryboat crosses the Hudson, we see a large steamer with three smokestacks going up the river. People on it look very small indeed. This ship has come across the Atlantic Ocean, bringing people and freight to New York City.

In a few minutes our ferryboat runs into another shed on the other side of the Hudson River. We have crossed from New York City to Jersey City. We have crossed from New York State to the State

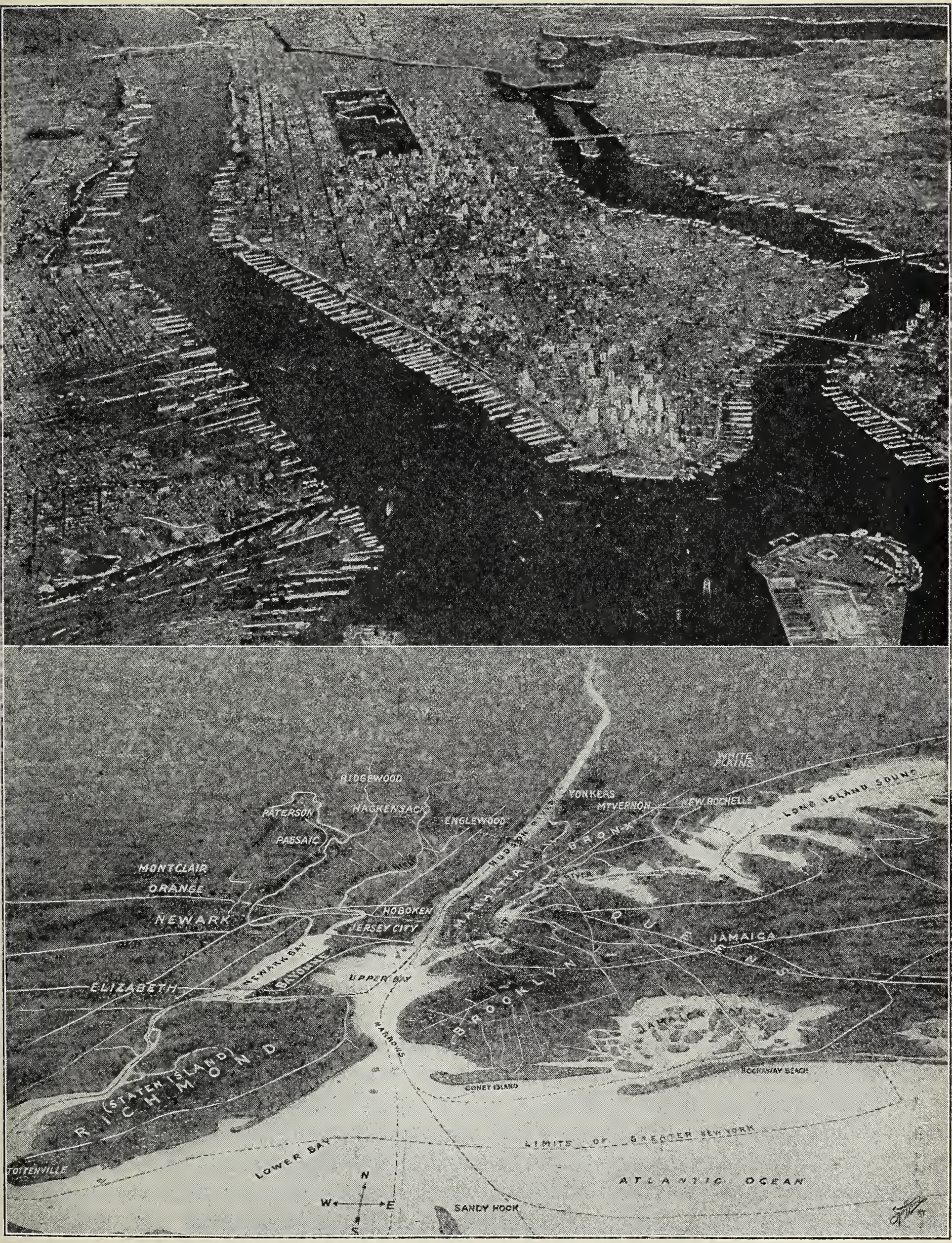

Fig. A. New York City is made up of five parts, or boroughs, as they are called: Bronx, Manhattan, Queens, Brooklyn, Richmond. Find these boroughs on the map. In the upper picture is the Borough of Manhattan. It is an island. It has more tall buildings than all the other boroughs. In our journey we crossed from Manhattan to Jersey City and continued through Newark, Elizabeth, and Atlantic City to Philadelphia. These cities, except Philadelphia and Atlantic City, are on the map. See the George Washington Bridge across the Hudson River.

Fig. A. A part of Atlantic City as seen from an airplane. See the hotels, the piers, the surf breaking on the sandy shore. Away at the top of the picture you see a part of the inlet where boats sail in and out.

of New Jersey. We drive through Jersey City, and soon afterward through Newark (Fig. 186-A).

Atlantic City. The next big city on our route is Philadelphia. The distance from New York to Philadelphia is ninety miles. How long would it take us to walk that far if we went three miles an hour and walked five hours a day? Express trains travel this distance in two hours. Our automobile can easily do it in four hours. As we shall spend the night in Philadelphia, we have time to go to Atlantic City on the way. The journey from Newark to Atlantic City takes only two and one half hours.

We shall have time to bathe in the ocean before lunch. Did you ever see the ocean? As far as you can see, there is only water. The water rises and falls in waves. The waves run up on the shore. At Atlantic City the shore, or beach, is low and sandy. People walking near the water's edge often get their feet wet because now and then a wave runs up farther than the other waves.

If a man walks out into strong waves, they will knock him down as easily as you can blow a feather with your breath.

Atlantic City is a health and pleasure city where people go to be by the sea, to bathe in the ocean, to rest, and to have a vacation. The weather here is usually much cooler in summer than it is at places that are far away from the seashore. This is because the breeze on warm days usually blows in from the sea, and in hot weather the sea is cooler than the land.

We go to a bathhouse, where we rent bathing suits. There are little dressing rooms where we can put on the bathing suits. Soon we join the hundreds of other people who are swimming or playing in the water or on the sand.

Inlet, bay, and ocean. After lunch we go to the inlet. The beach ends at the inlet, for the inlet is a narrow body of water connecting the ocean with the bay. On the ocean side of the beach the waves are beating, and the water is too rough for boats to go out through the waves. The bay is too small to have big waves. It is a quiet harbor, and small boats sail from the quiet bay into the inlet and on out into the ocean.

The water in the bay is shallow. The inlet is shallow. Many small boats come into this little harbor, but big boats cannot come in. Far out in the ocean we see a big steamer. It is so far away that it looks almost like a burnt match with smoke curling up from it. It is miles away. If we were near, we would see that many people are on the boat, and that it is larger than many houses. The steamer is going to New York. The inlet to New York Bay is wide and deep, and large ships can enter. The bay is also deep, and large ships can float without touching bottom. This makes New York Bay a fine harbor. Find New York Bay on Figure 186-A.

Truck farms. At three o'clock we leave for Philadelphia. Soon we are driving through pine woods. This land is so sandy that little grows here except pine trees. Does that suggest the reason why there are very few houses indeed? Soon we pass out of the pine woods into a land of farms. In one field we see fifty people bending over to pick strawberries. Beside the road is a little shed where a boy and a girl are selling fresh, ripe strawberries.

The earth here is sandy, but mixed with finer particles of earth. Such soil makes good gardens. As we ride along, we see whole fields of beans, peas, beets, potatoes, raspberries, and blackberries. The people grow fruits and vegetables on this good garden soil and send them to New York and other city markets. This is called *market gardening* or *truck farming.*

Atlantic Coastal Plain. The road is as straight as a line and as level as a floor. We do not see a single hill in all the sixty miles between Atlantic City and Philadelphia. Flat land like this is called a *plain.* This flat, sandy plain is called the North Atlantic Coastal Plain. For hundreds of miles up and down the shores of the Atlantic Ocean we find this coastal plain. For hundreds of miles it is level and sandy, and it is a good place to grow vegetables and fruit. This plain is not many feet above the surface of the sea. We call it a *low plain.*

Two cities beside a river. We soon see smokestacks ahead and the tall buildings of a big city. Our car goes toward the tall piers of a very high bridge. At the entrance to the bridge we stop, and the driver pays twenty-five cents to a man in uniform. This is the price we have to pay for using the bridge. To drive on to the bridge, our car seems to climb a hill. The bridge was built high enough to allow ships to go under it. From the highest part of the bridge we look down on the river far below us. Boats are going up and down the river, and ferryboats are crossing it. On one side of the river is a large city — Philadelphia. On the other side of the river is a much smaller city; its name is Camden. On this river we find two cities, just as there is a city on each side of the Hudson. The river separates two states; so we call it a *boundary.* Look at the map (Fig. 185-A)

Fig. A. In this picture you see almost all of the city of Philadelphia as it would look to an airman who was flying very high indeed. Point to the Delaware River, Camden, Philadelphia, the Delaware River Bridge, and to the Schuylkill River, which flows into the Delaware River.

and find the name of this river, and the names of the states.

On Figure 183-A find New York City; Philadelphia; the piece of the Lincoln Highway which joins these two cities. Find the Hudson River; the Delaware River. Find the cities and rivers also on Figure 185-A.

Make your own map. Using the scale 6 inches for each 200 miles, begin a map of the journey. Draw the map on the floor with chalk; on the blackboard; or on pieces of paper. Near the right-hand edge make a dot for New York City. Add to your map as you finish each part of the journey. Put in cities, mountains, and rivers crossed, and any other things which you may wish to show.

Using words. In a short letter about your trip, use the following words: ferry, smokestack, harbor, port, inlet, beach, plain.

Playing lecturer on a sight-seeing tour. 1. Play that you are the lecturer and the rest of the children are passengers on a sight-seeing bus. Using Figures 181–A to 190-A, tell about the places seen from the bus windows. Be sure to use the pictures in the right order. The lecturer may use a megaphone; the passengers may ask questions.

2. Tell about the difference between the soil along the Boston Post Road and that between Atlantic City and Philadelphia. Tell about the difference in their crops.

Distances and directions. 1. What part of a mile do you travel from your home to school? Point in the direction we should have to travel to reach Philadelphia from your school. If we walked a mile in that direction, where would we be? If we walked ten miles in that direction, where would we be? ninety miles?

2. Pretend that it is about nine o'clock in the morning. We are in an automobile on our way from New York to Atlantic City. I am driving and you are sitting on my right. In whose window is the sun shining? We reach Atlantic City and keep right on to Philadelphia. Shall we continue straight ahead or must we face in a different direction? Which direction?

Giving reasons. 1. Why is Atlantic City a summer resort?

2. Why is it not a seaport?

3. Why did we not travel to Atlantic City by sea?

Reading a drawing. At the right is a drawing. It shows three letters and lines connecting them. One letter is supposed to stand for New York; another, for Philadelphia; and the third, for Atlantic City. Which is *A?* Which is *B?* Which is *C?* How do you know?

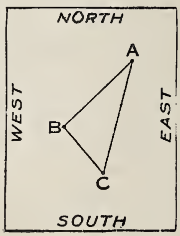

Fig. A. The Piedmont is a land of rolling hills, fertile and well watered, good for crops and for dairy cattle.

FROM PHILADELPHIA TO PITTSBURGH

Lincoln Highway. Before leaving Philadelphia we study the map and see that we shall follow the Lincoln Highway to San Francisco. We find that the distance from Philadelphia to San Francisco is about thirty times as far as from New York to Philadelphia. If we should walk over the Lincoln Highway from Philadelphia to San Francisco and go fifteen miles each day, we would arrive at San Francisco in about two hundred days. If we had a horse and went thirty miles a day, one hundred days would be required. If we went by train, we could leave New York on Monday morning and be in San Francisco Thursday night. An airliner can make the journey in less than one day. It will be fine to go by automobile, and since we want to see as much as we can, we shall travel only about 200 miles a day. If we are not delayed, we should go from Philadelphia to San Francisco in fifteen days.

As we leave Philadelphia, we pass for several miles through small towns. Many of the people of these towns near Philadelphia go to the city every day to work.

Leaving Philadelphia behind, we look at the wide, smooth surface of the Lincoln Highway and try to imagine how the Indians felt who traveled here long, long ago. They had only a footpath through the woods. Later the white settlers went on horseback. Then they cut down the underbrush and made the footpath wide enough for wagons. Still later, other men graded the road, others put gravel and broken stone on the surface and straightened some of the curves. Later, other groups of men made it wider, paved the long, long road with solid cement, and put signs or flashing signals in dangerous places. As our car speeds over a smooth cement surface wide enough for four cars abreast, we try to imagine that the road was once a path that ran through a dark forest where the traveler had to wade swamps and risk falling over rocky ledges.

Hilly land—the Appalachian Highlands. These Appalachian Highlands include three main divisions: the Piedmont, the Appalachian Mountains, and the Appalachian Plateau. Our journey takes us through all three of these divisions.

The Piedmont. The country west of Philadelphia is hilly. It is called the *Piedmont.* The coastal plain east of Philadelphia has no stones, not even one as big as your fist in twenty miles. West of Philadelphia solid rock sticks out of the banks in many places beside the road.

Fig. A. Westward a few hours' drive from Philadelphia are the Appalachian Mountains. Find forest-clad slopes, valley farm, stream, road, and upland farm. Find these mountains in Figures 183-A, 183-B, and 185-A.

The farms on the rolling hills have big barns — not small barns like those on the truck farms of the sandy plains. These big barns are the winter homes of cows, for these farms are dairy farms; the farmers sell milk to the people in cities and towns.

After a few hours we see far ahead something long and blue spread out across the country. It is a low range of mountains. As we come near it, the color changes, and when we reach the long mountain, we see only the green of the trees. It is a high, steep land covered with trees. For some reason, green trees seem to be blue when they are many miles away.

Appalachian Mountains. We are now in the Appalachian Mountains. The road here is never level. Our car is either going uphill or downhill. Most of the land is covered with trees. Few people live in this mountainous country. We see only a few small houses, and very few big barns.

We climb to the top of a high hill. Several automobiles have stopped; the people are looking at the beautiful scenery. We get out. We notice that it is cooler here in the mountains than it was in Philadelphia. Mountains are always cooler than the neighboring lowlands. We see many mountains, one beyond the other, and some are far away.

Appalachian Plateau. In the valley below us a river is shining in the sunlight. Beside the river are a road and a railroad. Beside the railroad is a little town of wooden houses built in straight rows. We see a queer-shaped building called a *coal tipple* (Fig. 193-A). At the top of the coal tipple is a black hole in the hillside; and as we look, a train of little cars comes

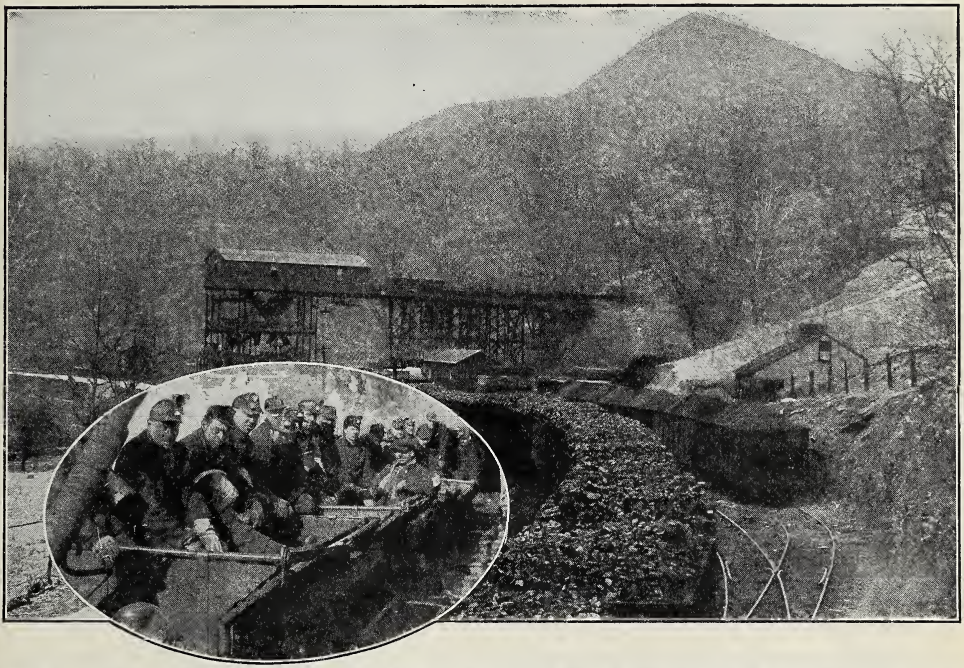

Fig. A. There are many interesting things which you should look at in these pictures: the miners coming from the mine; their lamps; the coal tipple; the mouth of the mine in the hillside near the coal tipple; the railroad with tracks and cars under the tipple. Point in the larger picture to where you think the mouth of the mine is.

out of the hole. The hole is the entrance to a coal mine. We watch the cars bring the coal out of the mine and take it to the coal tipple. Here it is loaded into the freight cars that stand beside the railroad. Just then an automobile with four men in it passes. They are wearing overalls, and their faces are black with coal dust. The men are miners going home from work. In the Appalachian Plateau hundreds and thousands of men make their living by digging coal which lies in layers between the layers of stone of which these mountains are made. Other hundreds and thousands of men work on the railroads that carry the coal to Philadelphia, New York, and to many other cities and country towns.

Going down to Pittsburgh. The road now follows down a stream for miles and miles. On one side of the stream is the Lincoln Highway, and on the other side is a railroad. Soon we begin to pass villages and towns, and over beside the railroad are factories and tall, black blast furnaces where iron is separated from the ore. There are factories as big as several baseball fields. In the factories is much machinery used in making the rails for railroads, the plates of steel for engine boilers, and many other things that men make of iron.

We are now coming to the city of Pittsburgh, 296 miles from Philadelphia. Pittsburgh is an iron-manufacturing city, with many coal mines near it. The city is set in several little valleys that streams have worn in the Appalachian Plateau. Pittsburgh stands at the place where two rivers come together to form a greater river

Fig. A. The city of Pittsburgh. What in this picture shows that the main part of the city is on the point of land between the two rivers which join to form a third river? In the foreground are suburbs of the city.

called the Ohio. As we cross this river, we notice that the bridge is not so high as was the bridge over the Delaware River. That is because ocean steamers cannot go up the Ohio. It has only river steamers, tugs, and barges, such as we see in Figure 194-A.

Draw your own. 1. Make a free-hand drawing to show the city of Pittsburgh, its rivers, and the near-by hills.

2. Underneath write a few sentences to tell important facts about the things which you drew.

3. Look carefully at Figure 192-A. Draw a picture of two mountains with a valley between. Draw a stream in the valley. Draw a road in the valley. Draw railroad tracks beside the stream. Why do roads and railroads follow along the stream in narrow valleys?

Writing sentences. 1. Look carefully at Figure 193-A. Write sentences telling about each of the following: miners; their lamps; the coal cars; the tipple.

2. Here are some words: trackless forest, Indian footpath, wagon trail, mud road, gravel, macadam or cement. Write a sentence about each word. Combine the sentences into a paragraph which will tell something of the "Life Story of a Road."

How much do you remember? 1. What is the level land east of Philadelphia called?

2. What is the name of the hilly land west of Philadelphia?

3. What mountains are a few hours' ride west of Philadelphia?

4. Find the southern end of these mountains on Figure 185-A. Find the northern end.

5. What mineral product is found in these mountains?

6. What is the first large city on the Lincoln Highway west of Philadelphia?

7. How far is this city from Philadelphia?

8. What is the chief industry in this city?

9. What two rivers join at this city?

10. What river is formed by the joining of these two rivers?

Picture talks. Each of four pupils may choose a picture on page 191, 192, 193, or 194. From the picture and the story in the book, be prepared to make the picture tell the class its story. Begin by saying, "I am the picture on page —." Then tell its story.

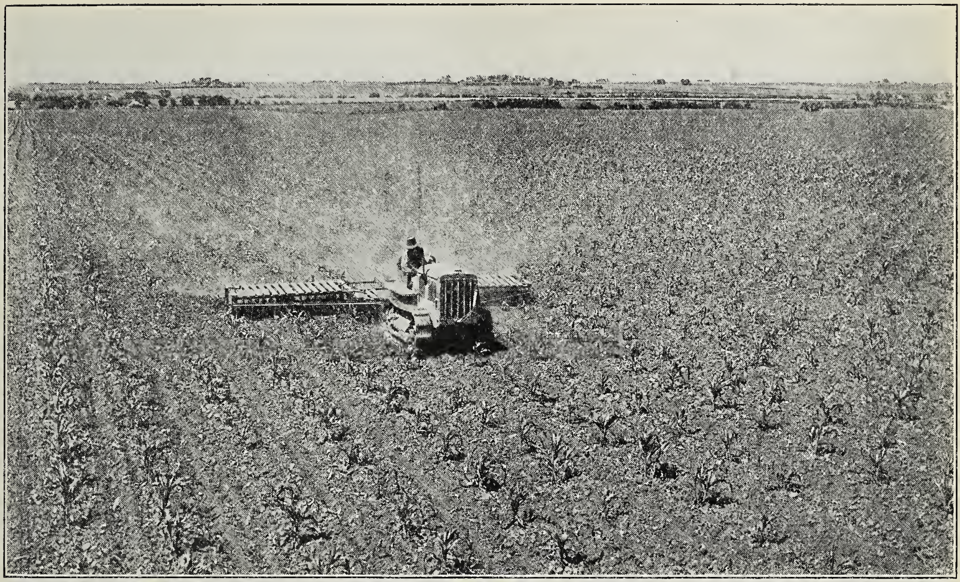

Fig. A. West of Pittsburgh on the Lincoln Highway the land becomes level. We are in the country of "King Corn." The man is cultivating the soil between several rows of corn.

FROM PITTSBURGH TO OMAHA

The Central Plain of North America. For several hours after we leave Pittsburgh, we are among the hills; but late in the day we come to a very different kind of country. We have reached the Central Plain of North America. This Central Plain is a part of the great *Interior Plains* region of North America which extends from the Appalachians to the foothills of the Rocky Mountains (pages 182–183). There are no hills. Often we drive for miles and do not see a stone. There is no forest. We see only a few trees here and there clustered around the houses or along the streams. All the land is in farms. Almost every field has a fence around it. Every farm has a big barn. We pass several towns. Tonight we shall not stay in a town, but in the open country. We stop at a house which bears a sign, *Rooms for Tourists*. The people who live here earn some money by taking care of travelers.

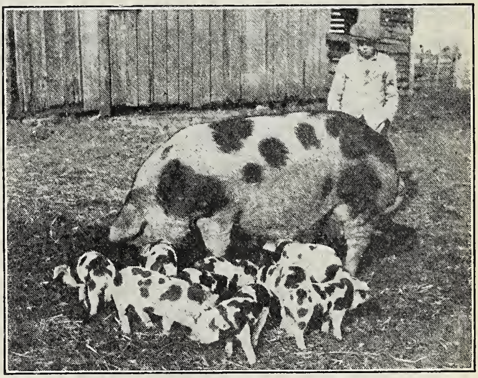

Fig. B. This litter of little pigs and their mother all belong to the farmer boy whom we visited.

Across the road is a farmhouse with a big barn near it. A boy with a shepherd dog at his heels comes out to ask if we want to see his pigs. The boy goes to a country high school. One of the clubs of this high school is a pig club. Every boy in his class is a member, and every boy has a pig. Some have several pigs.

Fig. A. A very small part of the downtown business section of Chicago. Off in the distance is Lake Michigan. Find the Chicago River which runs through this part of the city.

This boy's father has a hundred pigs on his farm. He also has twenty big, fat cattle. They will soon be beef in the butcher's shop.

The Corn Belt. On this farm are two large fields of corn. Here every farmer has a field of corn. For that reason, this central part of the country is often called the *Corn Belt.*

The next day we drive on, hour after hour, through small towns and past farms where we see corn fields, oat fields, hay fields, pasture fields, droves of hogs, herds of cattle, and big barns. Men are driving back and forth across the corn fields, cultivating corn. Others are out with mowing machines cutting grass to make hay. In the late afternoon we cross many railroads. It is easy to guess that we are near Chicago. This is a great city, with many railroads coming into it from all directions.

We pass a freight train standing at a station. It has several cars filled with live cattle and other cars full of live hogs. They are going to the great market for cattle and hogs at Chicago.

Some cars in another freight train are marked "Refrigerator." These cars have big boxes of ice in each end and are filled with hundreds of pieces of dressed beef, dressed pork, and dressed lamb going from Chicago, the great meat-packing city, to Pittsburgh, New York, and many other places.

We spend the night in a hotel in Chicago, 477 miles from Pittsburgh. To come from Pittsburgh to Chicago has taken us two and one half days.

Cities and highways. The Lincoln

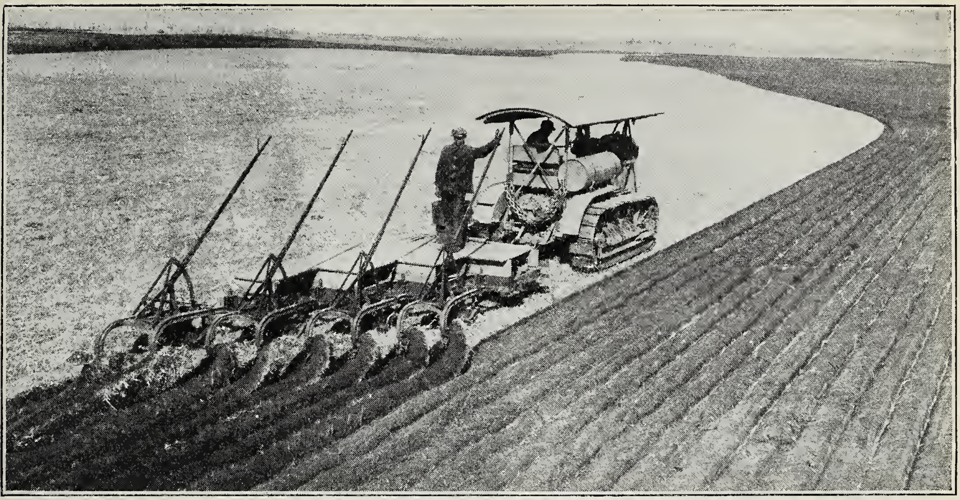

Fig. A. In the spring this big farming country through which we are traveling is a very busy place with its plowing and planting. The tractor is pulling a gang plow. Look closely and see if you can tell why this kind of plow is called a *gang plow*. How many furrows is it turning at one time?

Highway from New York to Philadelphia, Pittsburgh, and on past Chicago is sometimes called a *trunk route* because it is like the trunk of a tree with many branches. From this trunk line many branch roads go to the north and to the south. The branch roads connect many towns and cities with the Lincoln Highway. Perhaps you know the name of one of these cities where many automobiles are made. You can easily find the names of several large cities that are not far from the Lincoln Highway. Good roads connect the Lincoln Highway with almost every city and town anywhere near it.

The Lincoln Highway does not pass through the city of Chicago. If you have ever gone in an automobile through the streets of a great city, you can guess the reason. The city of Chicago is nearly twenty miles across. Automobiles can make much better speed by going around the city. We shall tell about Chicago on page 374. When we leave Chicago, we drive south to get back to the Lincoln Highway. Then we turn west again to go on across the level or gently rolling farm country.

Rivers. In the afternoon we come to a wide river having muddy water. The Indians called the river *Father of Waters* because it is such a broad, long river. For many years people who crossed it had to go in boats. Sometimes they could not cross at all because the river was frozen over with ice thick enough to stop the boats, but not thick enough to use for crossing. We cross easily on a fine bridge.

If we should go down this river in a boat, we would come to the Ohio River. The Ohio, which is a branch of the Father of Waters, is also a big river. Find a large branch of the Mississippi that comes in from the west; from the east. What are their names?

Western part of the Corn Belt. Three days after leaving Chicago we are still in the Corn Belt, for it is a very large region. Most of the land is farms, and the farms and buildings and crops and animals are very much like those in the eastern part of the Corn Belt.

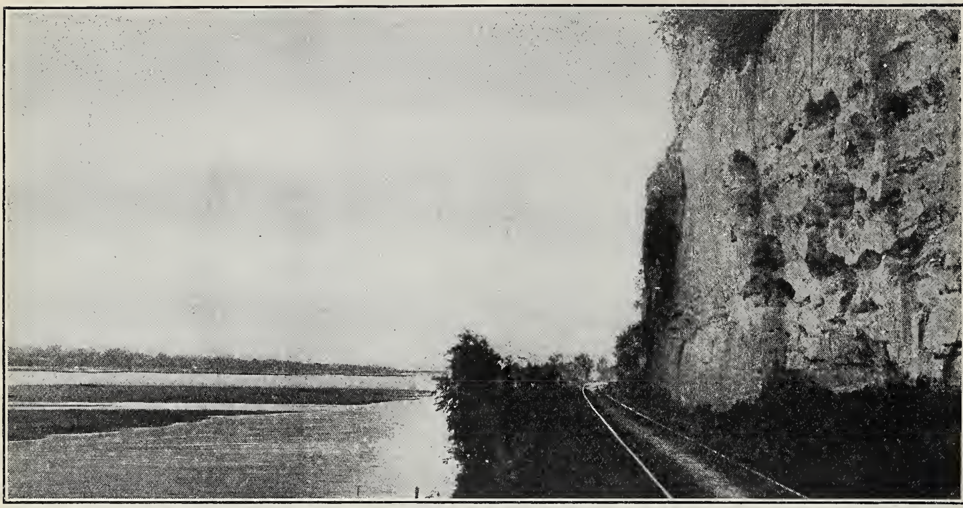

Fig. A. As we travel westward from Omaha the rainfall becomes less and less. Sometimes at low water sandbars appear in the stream bed. See the bluffs along the bank of the Missouri River.

On the afternoon of the third day after leaving Chicago, we find ourselves beside steep hills, but there are no stones. These hills are called *bluffs* — the Missouri River bluffs. We soon see the yellow, winding Missouri River. It is so filled with sand and mud that it is very shallow, and there are sandbars in the stream. It is sometimes called *Big Muddy.* Would this be a good river for boats?

Beside the yellow river is the city of Omaha, 524 miles from Chicago. Omaha is another city of the corn and cattle and hog country. It is not so large as Chicago or Philadelphia, but its meat-packing plants send much food to people in the eastern states. We sleep this night one hundred miles beyond Omaha. This is the end of our eighth day, and we are near the middle of the United States; half of our country is east of us, and half of it is west of us.

Telling about farming. Prepare a talk about farms in the Corn Belt. Use the following words: pigs, cattle, corn, hay, flat, level, railroad, refrigerator car, barns, river.

Make little sketches to illustrate your talk, or find pictures to make it more interesting.

Questions for you. 1. Why are there so many barns in the Corn Belt?

2. In what ways are the railroads useful to farmers?

3. If you were a salesman for automobiles or machinery, would you choose to canvass here or in the Allegheny Highlands? Why?

Blindman's buff. I shall tell you what I see around the blindman and you will tell me where he is lost.

1. There is a big city on a big lake. Railroads carry cattle and meat to and from the city. Where is the blindman lost?

2. The blindman is in the country. There are fenced fields, and many hogs and cattle, and large barns. Where is the blindman lost?

3. Now, lose the blindman on the bluffs of the Missouri River; on a trunk-line railroad; in the home of a pig-club boy, and in some other places we have been on our journey. From your descriptions, see if the class can find your blindman.

Trip the traveler. Let someone review for the class the section "From Pittsburgh to Omaha." At the end, let the class be ready to trip the traveler by telling important things that he may have omitted. Do not forget to use the pictures in your review.

Fig. A. After you have read the story on pages 199 and 200, tell what this picture shows.

FROM OMAHA TO SALT LAKE CITY

Little rain and few people. It is a long, long way from Omaha to Salt Lake City. On the Lincoln Highway the distance is 1,008 miles. There is not a large city in all that long distance. As you read, see if you can find why this is so.

For two days as we travel westward from Omaha, the road follows beside a branch of the Missouri River called the *Platte.* It is not a big stream; sometimes there is almost no water in it. In many places the river is full of sandbars. It does not rain here as much as it does near New York or Chicago.

After we leave the Platte River, the road goes off across a great plain. The small towns are often many miles apart. There are no trees for miles and miles, except sometimes a few little bushy ones around a house. Water is scarce. We travel miles and miles without seeing a stream. But on this modern highway are filling stations where we can get gas, oil, water, and supplies. These stations insure travel in comfort and without worry.

Irrigation and a ranch. Finally we cross a small stream. Beside it a farmer is busy watering his hay field. He has dammed the stream, carried the water across his field in a little ditch, and with a shovel he is making a dam across the ditch so that the ditch will fill with water. When the ditch is full, the farmer will let the water flow out into his field.

This way of watering crops is called *irrigation.* The farmer is irrigating his field so that grass will grow. He will cut the grass and dry it to make hay for his cattle to eat next winter. This part of the Great Plains, near the Rocky Mountains, has so little rain that there is not enough water to make trees grow well or to make corn grow well.

The man who is irrigating his hay field has a very large farm called a *cattle ranch.* All of his ranch except the hay field is in pasture, and his farm is as big as twenty farms near Chicago. This big farm, or ranch, has only one family on it, and it has no more cattle than we found on the farm near Chicago.

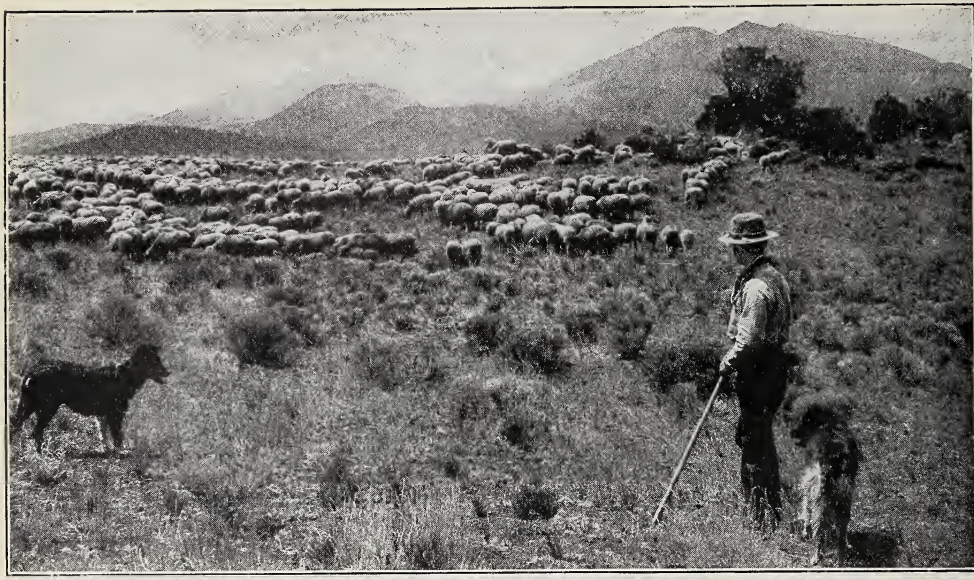

Fig. A. A shepherd, his dogs, and a flock of sheep on the Great Plains just east of the Rocky Mountains.

We decide to camp out for the night at this ranch. The ground is dry, the weather is clear. The farmer lets us spread some of his hay on the ground beside our automobile. We wrap up in blankets and sleep on the hay under the open sky. We like this. The next time we come we shall bring a tent and sleep in our tent every night, as thousands of automobile travelers do.

Great Plains and sheep. This treeless plain east of the Rocky Mountains, where the rancher is irrigating his hay field, is called the *Great Plains.* The surface of the Great Plains is much higher than the surface of the ocean. Indeed, at the foot of the Rocky Mountains the surface of the plain is twice as high above the sea as are the tops of the highest mountains near Pittsburgh.

We are surprised at this because, as we came over the road, our car did not seem to be climbing so much. We notice that the nights here are much cooler than they were on the lower land near the Mississippi River. It is too cool for corn to grow well. Plateaus are like mountains in being cooler than the lowlands near them.

The next day we travel many miles, and when evening is near we stop near a stream of water. We are not far from the Rocky Mountains. A sheep herder is coming down to the stream from the plain with his flock of two thousand sheep. As the sheep come near the stream, they run to get a drink.

When the flock has eaten all the grass in one place, the man moves the entire outfit to some other place where there is more grass. Many such herders and flocks are roaming far up and down the Great Plains, for hundreds of miles north of the Lincoln Highway and hundreds of miles south of the Lincoln Highway.

High mountains. In this country of the sheep herder, we can see blue mountains in the distance. Sometimes their tops shine with snow because the tops of

Fig. A. On our trip we drove through the mountains which you see back of Salt Lake City and down to our hotel in the business section of the city. Then we drove out to bathe in Great Salt Lake.

mountains are much colder than the lower land near them. In the mountains we see steep, rocky land and forests of pine trees. Streams of clear cold water gurgle and roar and foam as they come tumbling down over the stones and rocks in their river beds.

Trees and treeless land. At last we are approaching Salt Lake City. We are still in the mountains, with trees all about us. The automobile makes a turn in the road and we see a strange view. In front of us and far below is the plain. At the foot of the mountains is a band of green fields and Salt Lake City with many beautiful shade trees. Beyond the city is a wide plain without trees or fields or houses or green grass. This barren land is called *Great Salt Lake Desert.* It is a desert because it is so dry. The city has green shade trees and green fields near it because the land is irrigated by water that comes down from mountain streams.

Great Salt Lake. As we look from the mountains across the plain, we see the blue water of Great Salt Lake. This is a strange lake. Its water is very heavy.

An Experiment. If you will try this experiment, you will understand why the water of Great Salt Lake is so heavy. Take a glass and fill it almost full of water. Drop a teaspoonful of salt into the glass of water. Wait until you cannot see the salt. It goes into the water. We say that the salt *dissolves.* Dissolve another spoonful of salt in the water. You can put in several spoonfuls of salt, and the glass seems to be no more full than it was before, but of course the water is much heavier. It is interesting to begin with a glass in which an egg has been sunk to the bottom of the water. Tell what happens to the egg as more and more salt is added to the water.

Great Salt Lake has much salt in it — more salt than the sea — so much salt that swimmers, like the egg in the glass of salt water, could not sink if they tried. That makes swimming very safe. Many travelers stop to swim in the lake.

Important words: Ranch, irrigation, plateau, lowland, desert, dissolve. Your teacher will call a word and the name of a pupil. If the pupil gives the correct mean-

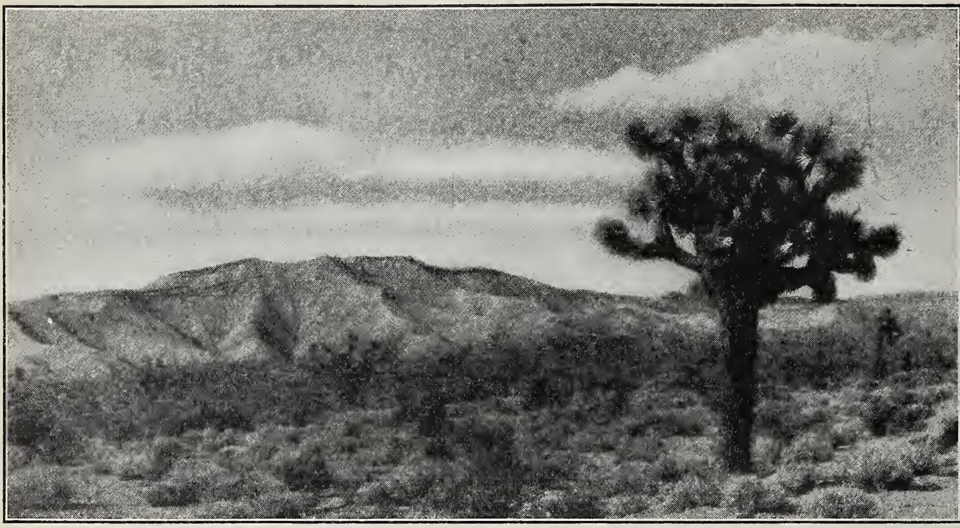

Fig. A. In parts of the desert where there is some moisture, bunch grass grows. You can see this grass in the picture. Here and there also are stunted trees which have learned to live without much water. The largest tree in the picture has bunches of needle-shaped leaves. Why did it not grow broad, flat leaves?

ing, he may call the next word and the name of a child, and so on until the entire class is tested.

Something to explain. Look at Great Salt Lake on a map. Do you see any large streams flowing into or away from it? Now look at Lake Michigan. What do you find there? Then try to explain why Lake Michigan has fresh water and why Great Salt Lake has salty water.

Making a model. Suppose you were a farmer, west of Omaha; show how you would irrigate a field by using your sand table, clay, sawdust, or flour paste. Or you may use cardboard, paper, scissors, and paste. It would be better still to use a corner of your playground. Model a mountain, a mountain stream, a dam, a ditch, and a field. Use Figure 199-A to help you in this work.

Making word pictures. Choose six pupils to make the *word pictures.* The first pupil takes the section called "Little rain and few people." Study your section very carefully and be able to "paint a word picture" of it. The next pupil takes the second section, "Irrigation and a ranch," and so on until the six sections are given out. The class will vote for the best and the second best "picture."

ACROSS THE BASIN AND OVER THE SIERRAS TO SAN FRANCISCO

The Great Basin and the mountain streams. If you will look at the map you will see that there are high ranges of mountains near the Pacific Ocean, not far from San Francisco. Their name is *Sierra Nevada.* Going over these mountains is the hardest climb we have in the whole journey from New York to San Francisco. You remember we found beautiful trees and green fields at the foot of the mountains near Salt Lake City, because mountain streams water them. This happens also at the eastern foot of the Sierra Nevadas near towns called Truckee and Carson City. The country between the Wasatch Mountains at Salt Lake City and the Sierra Nevadas is much lower than these mountains. In fact, it is surrounded on all sides by higher land. For that reason it is called the *Great Basin.* Very little rain falls in the Great Basin. Some parts are so dry that it is

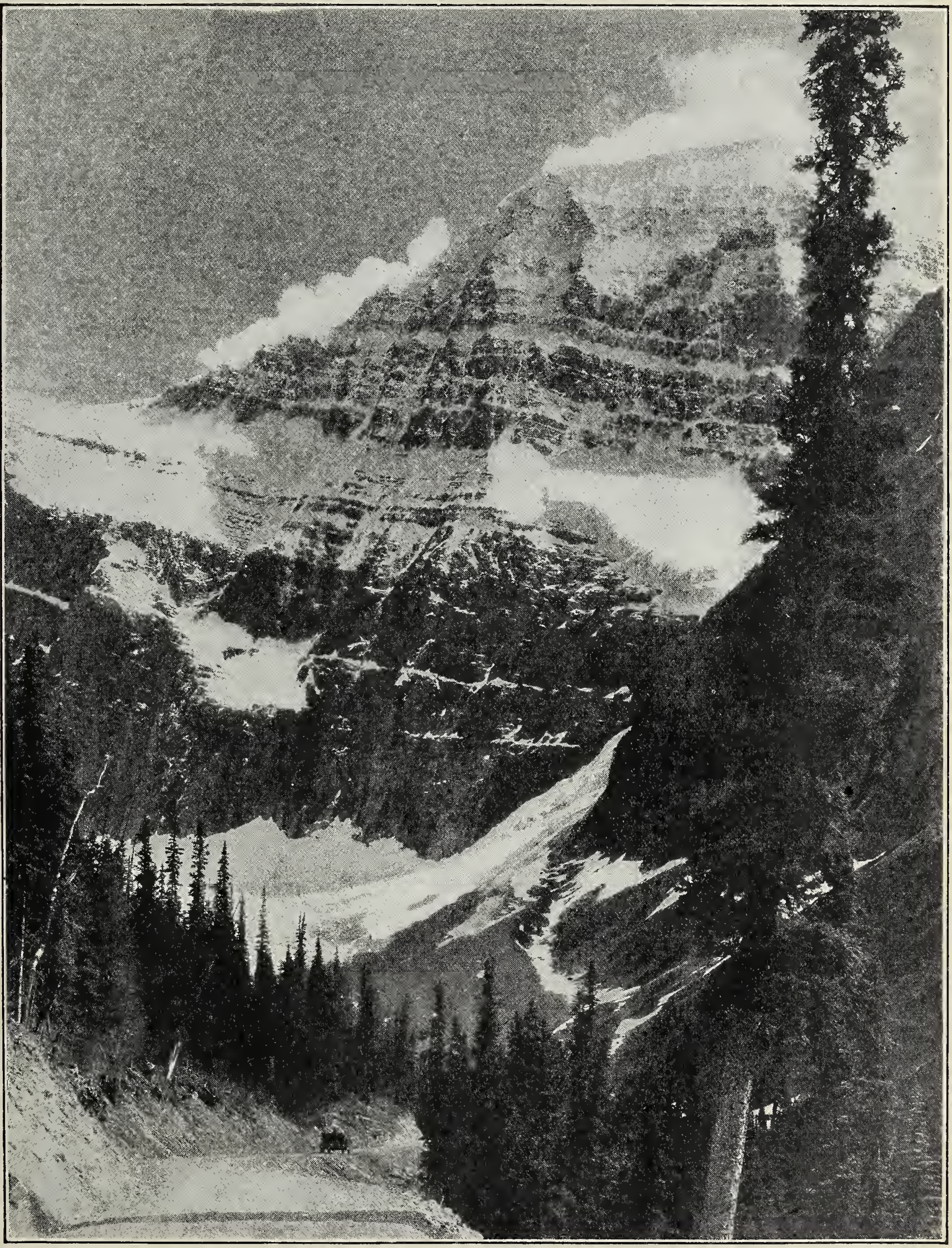

Fig. A. We did not see this mountain on our trip. It is beautiful Mount Edith Cavell in the Canadian Rockies. There are hundreds of peaks like this in the Rocky Mountains and in the Sierra Nevadas.

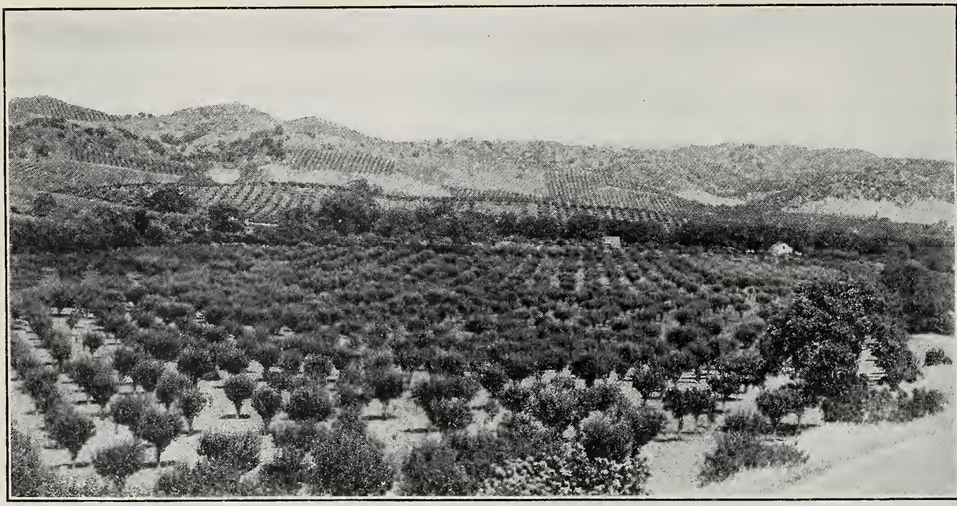

Fig. A. After traveling through the mountains we came down into the Great Valley of California. The foothills were crowded with orchards. Find some fruit-wrapping papers with the word *California* on them.

called *desert.* There is no forest here and there is very little grass, nor do we see fields with crops in them. In most places we see only scattered bushes as high as your knee or your waist. The ground in the Great Basin is often white and bare, and the glare of the sun hurts our eyes. Here and there we see the home of a ranchman who has some sheep or cattle that pick a living by eating the desert bushes. The next ranch house may be miles away. It is nearly six hundred miles across the Basin. The country is dry and dusty; and in the middle of the day, it gets very hot. We are in a hurry to get away from the heat and dust, and so we make this part of our journey in a day and a half.

The mountains. The last day of our journey is wonderful. This is the day we go over the Sierra Nevadas and reach San Francisco. Up we climb — up from the Great Basin — up, up, up the side of the Sierras. We follow a stream which splashes over the rocks and runs swiftly. As we see the clear water and the beautiful pines and feel the cool air, we are very happy. We talk about the difference between this place and the dusty Basin we were in yesterday. At the foot of the mountain are small trees. As our automobile, winding in and out, climbs higher and higher, the trees get larger, for it rains more here in the mountains. If we had time, it would be interesting to visit the lumbermen who are sawing down trees in this forest. After the trees are cut down, the logs are taken to a sawmill. There an engine runs a wonderful saw that slices the logs into boards almost as easily as you can slice a loaf of bread. There are gold mines here, too, where men go far down into the ground to dig out gold. It would be interesting to climb to the tops of some of the peaks and to camp for a few days in the mountains.

Near the top of the mountain we see the railroad which also crosses the mountain. It is entirely covered with a shed. This shed is miles long. It is called a *snow shed.* The snow gets eight or ten feet deep here in winter. Trains cannot

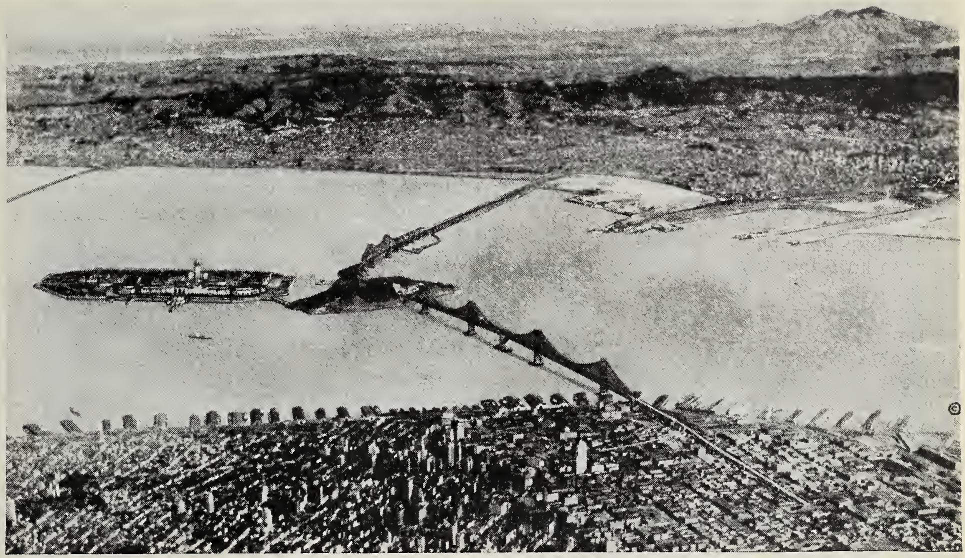

Fig. A. The San Francisco-Oakland Bay Bridge as it will appear when completed. In the distance are the cities of Oakland, Berkeley, Alameda, and Piedmont. The great bridge which will connect these cities will be about 7½ miles long.

pass in deep snow, and so the shed is built to keep the snow from covering the tracks. We are glad to be in the automobile, from which we can see the beautiful trees and the countryside.

The orchards on the slope. As we go down the west side of the Sierra Nevadas, we come at last to the land where man can plow and make orchards. Close to the edge of the forest we see hundreds of orchards, small farms with houses close together, and packing houses where farmers bring peaches and pears and plums and apples to be sorted and packed into boxes for market. The fruit belt on the slopes of the Sierra Nevadas is indeed a busy place.

San Francisco. Now we cross a wide, flat valley. We ride for miles through hay fields, grain fields, pasture fields, and truck farms, and then we see San Francisco. We have to cross the bay on a ferryboat to reach the city; but before long automobiles will be driving over the great bridge which will span the bay between San Francisco and Oakland. San Francisco reminds us of New York and Atlantic City: it is on a sheltered bay with an inlet. San Francisco Bay is deep, and so the big ships can enter it. Hundreds of ocean steamers come here every year, for San Francisco is a great port from which you may take ships for dozens of foreign countries. In another way, San Francisco is not at all like Atlantic City or New York. It is built on high hills, and the shore, instead of being sandy, low, and flat, like that near Atlantic City, is high, and the waves beat and splash upon the rocks.

San Francisco is much cooler in summer than New York or Atlantic City. This is because the Pacific Ocean here is cooler than the Atlantic Ocean is at New York or at Atlantic City. The cool ocean makes the sea breezes cool, and the sea breezes make the city cool.

Tell a story. "My Day in the Great Basin"; "My Day in the Sierra Nevadas." Are the two days very much alike or very different? Who will tell the better story?

A relay race. Divide the class into four groups. Divide a blackboard into four columns headed as follows: 1. Through the Great Basin; 2. Over the Sierras; 3. The Western Side of the Sierras; 4. Into San Francisco. At a signal, the first child from each group goes to the board and places in his column a few words to suggest a picture that comes to his mind when he sees the column heading, as: hot days or dusty, for column 1; snowy tops or forests, for column 2. Score 10, 8, 6, and 4 for speed in finishing; score 5 for each correct picture. The group with the highest score wins. Or this game may be played at your seats by writing.

A free-hand map. 1. Look at the picture (Fig. 205-A). Make a drawing that will show San Francisco, the harbor, the bridge, and anything else that you think is important.

2. Compare your map with New York and its harbor and be ready to give a talk, "Two harbors I have seen."

Looking Backward at the Journey

Is your map complete? 1. To answer this question, review quickly pages 181–205. Add to your map things you may have overlooked.

2. *Using maps.* On Figure 182–183-A, point to the part of Lincoln Highway that is in the Interior Plains. These plains extend north of the highway and south of the highway. Pass your fingers over their extent. You have passed your fingers over what is called a *natural region.* Do the same for the other natural regions: Appalachian Highlands, Atlantic Coastal Plain, Rocky Mountains, Great Basin, Sierra Nevada and slopes.

3. Find these natural regions on the map, pages 168–169.

4. Do you think the natural regions through which we passed on our journey are the same now as when America was first discovered? Give some reasons for your answer.

Making a picture notebook. As you have completed the reading of the first chapter in your book, you might begin a picture notebook to pass on to the next fifth-grade class; or to send to a foreign Red Cross cousin. Choose pictures *that show typical scenes* from each of the different kinds of country (natural regions) you saw on your journey. Paste the pictures in order in your picture notebook, and under each write a few sentences to tell what the people do there. Look for pictures in old magazines or in railroad folders. Your notebook might be cut in the shape of the United States, from heavy paper. Continue your notebook as you complete each chapter in your geography book.

Acting occupations. In your journey you have seen people doing many kinds of work. Divide your class into small groups. Each group may act an occupation, using speeches, motions, or scenery. The other groups will try to guess each occupation acted and its natural region.

Make-believe realtors. Choose six pupils for real-estate agents. Each agent tries to sell his or her classmates a new home in one of the regions listed below. Bring forward all the facts and points as a true realtor would and ask your teacher to tell you who makes the best and next best salesman. Then let the pupils who bought homes give reasons for their choice, as follows:

1. I choose a home in the Atlantic Coastal Plain because..

....

2. I choose a home in the Appalachian Highlands because..

....

3. I choose a home in the Central Plains because..

....

4. I choose a home in the Great Plains because

....

....

5. I choose a home on the Sierra Nevada slopes because..

....

6. I choose a home in San Francisco because

....

....

The hardest words in the whole chapter. Below are the hardest words in this chapter:

sandbars	inlet	seaport
port	harbor	irrigation
plateau	plain	coastal plain
trunk route	bluff	bay

Copy from the book a sentence about each of these words. Now, make up a sentence of your own about each word.

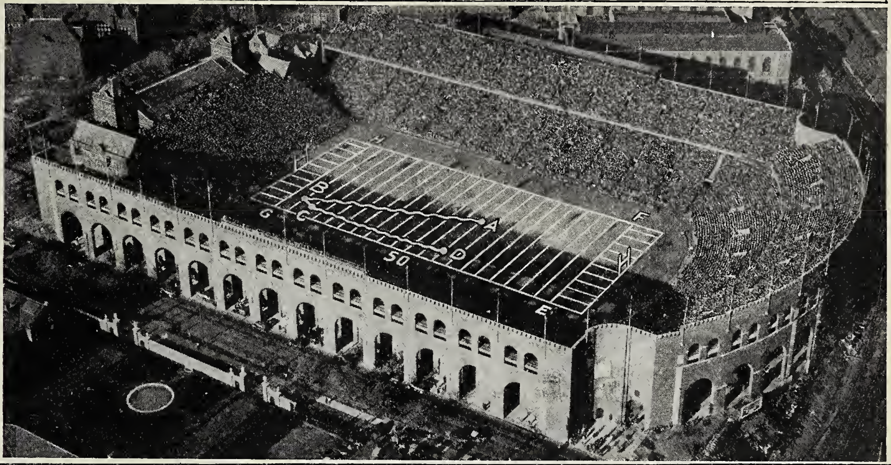

Fig. A. Franklin Field, Philadelphia, just before a football game between the University of Pennsylvania and the University of Notre Dame. After you have read this page, you will understand the lines, figures, and letters painted on the playing field.

TELLING WHERE PLACES ARE

yes.

LATITUDE AND LONGITUDE

Locating places on a football field. How do you tell a person where something is? Let us see how it is done on a football field (Fig. 207-A). We shall imagine a few plays in a football game between the University of Notre Dame team and the University of Pennsylvania team. The ball is put into play at *A*, near the center of the field. This point is 40 yards from the line *EF*. How long is the playing field? The field is usually marked off with white lines every 5 or 10 yards so that the players can tell just where they are, and so that the spectators can tell how the game is going. How far apart are the lines on Figure 207-A?

To score, the Notre Dame team must carry the ball across the line *GH*, which is called Pennsylvania's goal line. That makes a touchdown and counts six points. The Pennsylvania team wishes to carry the ball across the line *EF*, which is Notre Dame's goal line. The ball is put into play by being kicked from the point *A*, which is said to be on Notre Dame's 40-yard line because it is 40 yards from her goal line, *EF*. Point *A* is also Pennsylvania's 60-yard line for the same reason. The first kick sends the ball to *B*. How far is that from Pennsylvania's goal? A man catches it and carries it back to *C*. How far is that from Pennsylvania's goal? A Pennsylvania player kicks it from *C* to *D*, where a Notre Dame player catches it. How far is that from Notre Dame's goal line? The players would say that the ball is on Notre Dame's 40-yard line. The point *C* is on Pennsylvania's 10-yard line.

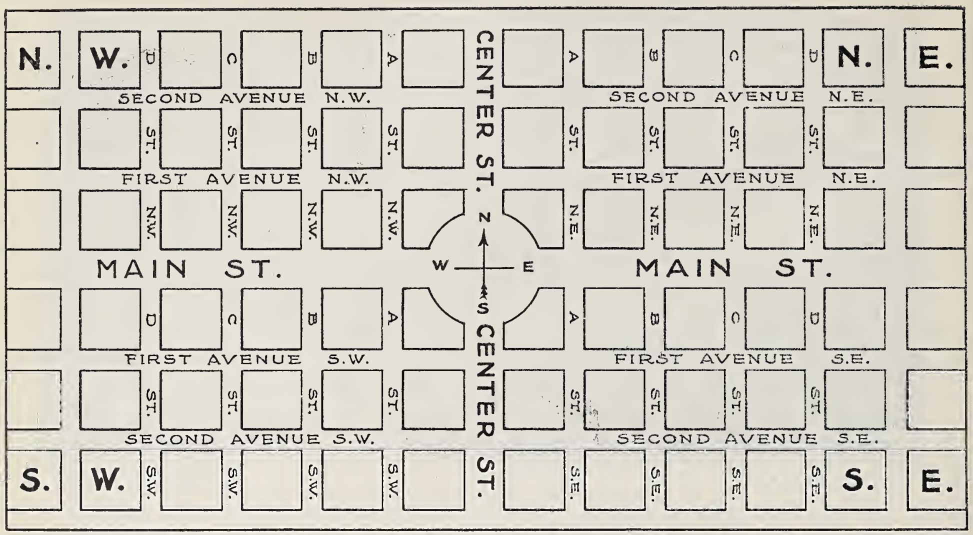

Fig. A. This is the street plan of the town which you will read about on this page.

You see that on the football field everything is located in one direction by its distance from the goal line; but the referee would tell you that the point *C* is also 6 yards from Pennsylvania's right side line, *GE*, and that the point *D* is 6 yards from Notre Dame's left side line, *EG*. Can you point out on this figure a place that is 3 yards from Notre Dame's right side line, and a place that is 3 yards from Pennsylvania's left side line? Can you give a reason why they do not use *east, west, north, south* to locate the ball on a football field?

Locating places in a town. How can you tell where a house is in a town? Figure 208-A shows a good way of doing this. One street, Main Street, goes from east to west and cuts the town into two parts, the northern half and the southern half. Another street, Center Street, goes across Main Street, cutting the town into two other halves, the east half and the west half. Point out the northeast quarter of this city; the northwest quarter. It is made still more easy for you to find your way by giving number names to all the streets running one way, and letter names to all the streets running the other way. Find B Street Northwest (N.W.); B Street Southwest (S.W.). The map shows that two streets are really one street, with two names in the different quarters of the town. Find such a street. Now find C Street Southwest (S.W.) and A Street Southeast (S.E.) Would you rather go to a strange town and find the streets named A, B, C, D, E, or named Charles, Henry, Poplar, Maple, Euclid, Yale?

When you go east on First Avenue from North Center Street, the first street is named A Street (N.E.); the second is named B Street (N.E.); the third is named C Street (N.E.). Find First Avenue Northwest (N.W.); First Avenue (S.W.). This system of laying out a city makes it easy for people to find their way about town. In some cities they have another good scheme. All the

numbers on the houses between A Street and B Street are numbered between 100 and 199; between B Street and C Street are numbered between 200 and 299; between First Avenue and Second Avenue are numbered between 100 and 199; between Second Avenue and Third Avenue are numbered between 200 and 299. With this system, where would you expect to find No. 210 A Street (N.E.)?

Locating places on the globe. Hold an apple by the stem or put a string around an orange so that you can hold it up as though it had a stem. Stick a pin in the apple or orange. Your problem is to tell someone where the pin is on the apple, and you must neither point nor touch. Try doing it this way: As you hold the apple by the stem, take a pen or pencil or knife and make a mark around the apple halfway between the stem and the blossom end. If it were a globe instead of an apple, you would say that this line was halfway between the north pole and the south pole. The line marks the middle of the apple between its stem and blossom, or between its poles, if we choose to call them that. Now we can say that our pin is above, or north of, the middle, or the equator, of the apple. How can we tell how far the pin is from the equator? Let us do as the football players do. They start from the goal line, measure distances from the goal line, and mark other lines on the field to show the distances from this starting line. We shall do the same thing, but we shall not use *yards* as the football players do.

Latitude. Long ago the map makers decided that they would divide the distance around the world into parts, called *degrees*, just as they mark a circle when they wish to talk about it. Every circle may be divided into 360 equal parts called degrees. It makes no difference whether the circle

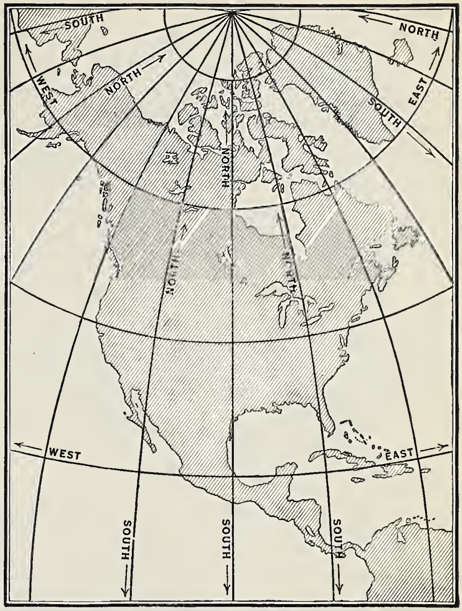

Fig. A. On this map of North America, point to meridians and parallels. Tell how you would use these lines to locate any spot on the map.

is the size of a cent, or the size of a half dollar, or the size of a wheel, or the size of the world. How many degrees are there in a whole pie? in a quarter of a big pie? in a quarter of a small pie? If there are 360 degrees around the world, how many degrees are there from the north pole to the south pole? How many from the north pole to the equator? from the south pole to the equator?

Now look at the map (Fig. 178-A). Find the equator. On the edges of the map as we go away from the equator, notice the lines marked *10, 20, 30, 40.* These are much like the yard lines marked off on the football field.

To locate anything on the world, we start with the equator and go both ways, just as we did in the town where we started at Main Street and measured south of it, First Avenue, Second Avenue; and north of it, First Avenue, Second Avenue. This

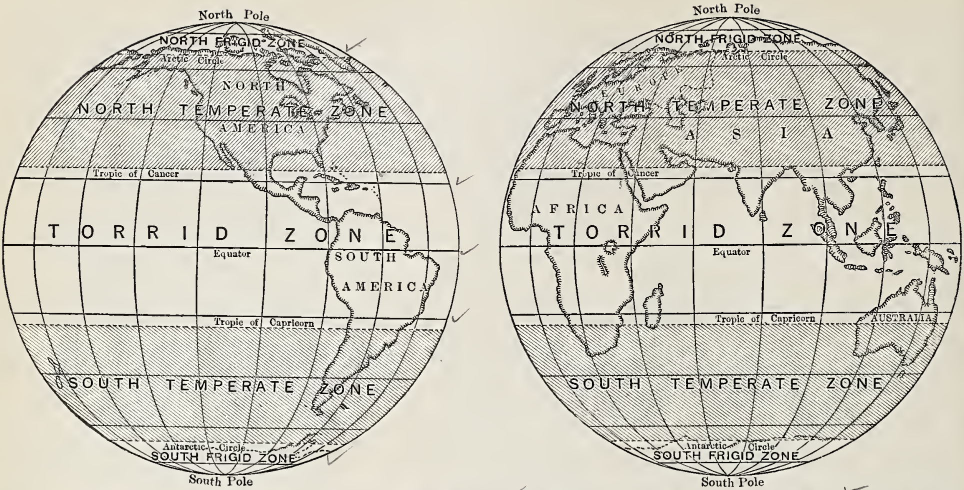

Fig. A. Point on these maps to the Western Hemisphere, the Eastern Hemisphere, parallels, meridians, each of the zones. Name the parallels which bound each zone. Name and point to each of the continents.

way of locating says that a certain place is so many degrees north of the equator, or north latitude; or so many degrees south of the equator, or south latitude. Now stick your pin in the apple in north latitude; in south latitude. Perhaps you can find the latitude of your home.

Longitude. Mark on your apple or point out on the globe several places that are 10 degrees north of its equator; 20 degrees north. Can you tell just where a place is by giving only its latitude? We need something else to help us get the east-west location. Long ago the map makers did very much the same thing that the football players do when they lay down a goal line and measure from that as a starting point or base line. We shall make a base line on the apple. Make a mark on the apple from stem to blossom, from north pole to south pole. Now you can say that you stick your pin in the apple at 10 degrees north latitude and that the pin is to the left, or west, of your north-south line, or to the right, or east, of your north-south line. These north-south lines on the globe or map are called *meridians*. In this country and in England and in many other countries, the map makers use as the starting meridian line or base line the line that runs from the north pole to the south pole and passes through an observatory in a suburb of London called Greenwich. This is called the *prime meridian*. Now find on your map on page 185 a meridian that is marked *75*. That means that this line is 75 degrees from Greenwich. What direction is it from Greenwich? Find other meridian lines on this map. Find some on the map on page 209. Now we can really locate a place on a map just as the football referee locates a ball on the field. He would say that a ball was on Pennsylvania's 20-yard line, 12 yards from Pennsylvania's right side line. In much the same way can you tell just where your home is? First comes latitude, or distance in degrees from the equator; then comes longitude, or distance in degrees from the prime meridian. Places have east longitude or west longitude.

Zones. We have one more way of locating places. The surface of the earth is divided into five wide belts called *zones*. They reach around the earth east and west, just as do the parallels of latitude.

All the land on which the sun shines directly down at noon at some time in the year is called the *torrid* (or equatorial) *zone*. The torrid zone extends $23\frac{1}{2}$ degrees, or about 1600 miles, on each side of the equator. The lower lands in this zone are hot, and there is no cold weather there except on high mountains or plateaus.

In Eskimo land the sun shines all night in summer, while in winter there are some days when the sun does not shine at all. All that part of the world in which there are days, or even a single day, when the sun does not rise at all, is called the *frigid* (or polar) *zone*. Frigid means cold. There is a north frigid zone and a south frigid zone, of which the centers are the north and south poles. The land between the two frigid zones and the torrid zone is called the *temperate* (or intermediate) *zone*. There is a north temperate and a south temperate zone.

Directions on a map. We learned (pages 21 and 22) that going north means going directly toward the north pole and that going south means going directly toward the south pole. Look at figure 209-A and you will notice that the lines of longitude all lead to the poles. You will also notice, if you study the map, that going directly north, or toward the north pole, does not always mean going directly toward the top of the map. It depends on where you start from and how the map is placed on the paper and what kind of a map it is.

An experiment. Turn to the map, pages 214 and 215. Place your finger on Mexico City. It is right near the 100° meridian. Follow this meridian through Mexico, the United States, and Canada. You have traveled a line directly toward the north pole. Did you trace a line also directly toward the top of the map? Now find Iceland. The 20° meridian passes through it. Trace a line directly north along the 20° meridian toward the north pole. This time did you trace a line directly toward the top of the map? Can you see now that the one thing that means north on a map is directly toward the north pole? From this experiment you might make two rules:

1. To go north or south from any place on a map, go directly toward the north or south pole.

2. To go east or west from any place follow the parallel of latitude east or west.

Locating places on a map. Turn to the map, pages 184 and 185, and notice that across the top are the letters M, N, O, P, . . .X. Each letter is between two lines of longitude. Down each side of this map are the numbers, 2, 3, . . .7. Each number is between two parallels of latitude. These letters and numbers help you find places on a map. To find Phoenix, Arizona, (O-5), place your finger on O at the top of the map. Notice it is between 110° and 115° west longitude. Find the number 5 on the left side of the map. It is between 30° and 35° north latitude. Now follow down O between the lines of longitude and across from 5 between the parallels of latitude until they meet. In this square you will find Phoenix. Find Sacramento (M-4) and Buffalo (V-3).

How. 1. How do you locate a spot on a football field? a house in a city? a place on the globe? a city on a map?

2. How do you name directions on a map? on the globe?

3. How do you suppose the zones got their names?

Fig. A. Where do you think these two March pictures were taken? This chapter will tell you.

CROSSING THE CONTINENT BY AIRPLANE

MAINE TO MIAMI AND NEW ORLEANS

No

We have crossed our country from east to west by automobile. Let us do it again by another route and travel faster.

We start from a country town in the northeastern part of the state of Maine. We are explorers going on a trip to find what the weather is like and what people are doing in different parts of our country the first week of March. (*Very important:* Use the maps, pages 184–185 and 214–215, all the time you are studying this chapter.

Deep snow in Maine. As we start out, the snow is a foot deep in northeastern Maine, the people are wearing overcoats and mittens, and some have caps pulled over their ears. At the railroad station we see the "Potato Special," a long train which leaves northern Maine every day during the winter. It is loaded with potatoes for the people of Boston, New York, and other cities to the southward.

Many farmers have come to the station with sleds and trucks loaded with barrels of potatoes. The potatoes are covered with thick blankets to keep them from freezing as they are being moved from the warm potato cellars to the thickly lined refriger-

Fig. A. Harvesting celery in Florida. The warm, moist winter and the sandy soil of the Florida Peninsula just suit early vegetables. After you have looked carefully at this picture, write three sentences: (1) about the harvesters; (2) about the wagonload of boxed celery; (3) about the freight car.

ator cars. These refrigerator cars keep fruit and other products cool in summer and warm in winter.

We leave northern Maine in the afternoon and travel day and night. Our train makes only a few important stops. In fifty-two hours we reach Miami, Florida. Trace our journey on the map (Fig. 185-A). What is the latitude of northern Maine? of New York City? of Washington? of Charleston, South Carolina? of Miami?

Miami and Miami Beach remind us of Atlantic City. We see a city on a long, narrow island, with a bay at the back and a fine sandy beach in front.

Sea bathing in Florida. It is the month of March everywhere in the United States, but does March give the same kind of weather everywhere? March gives snow to Massachusetts and Maine, and frozen ground and cold winds to New York and Pennsylvania. March gives warm sunshine to Florida. At Miami Beach hundreds of people are on the beach and bathing in the sea, as they were at Atlantic City in June (page 188).

As we walk about Miami, we see palm trees and other trees in full leaf. Flowers are in bloom. People are wearing straw hats, and workmen are going about without coats. It will be two months before leaves and flowers and straw hats appear in Maine.

A winter playground. In the morning we take an automobile ride. We pass green golf courses where people from New York, Philadelphia, Montreal, and many other northern cities are playing golf. We pass many fine homes where people from the North spend the winter. There are big hotels, little hotels, and apartment houses and boarding houses where people stay who do not have homes here, but want to enjoy the warm climate. There are camps for people who travel in automobiles and camp out as they go. We count automobile tags. In an hour, in the streets of this one city in Florida, we get a list of tags from twenty-three states.

Harvesting truck crops. Why do you suppose those people are stooping over again and again in the fields near the city? Do you not see that they are groups of workers gathering radishes, string beans,

ARCTIC OCEAN
ATLANTIC OCEAN
PACIFIC
ASIA
GREENLAND
Interior of Greenland entirely covered with ice
ICELAND
Reykjavik
Denmark Strait
Davis Strait
BAFFIN BAY
Upernivik
Etah
Hudson Strait
HUDSON BAY
BELCHER IS.
Churchill
Port Nelson
LABRADOR
NEWFOUNDLAND
Gulf of St. Lawrence
NOVA SCOTIA
Halifax
Cape Sable
Boston
Cape Cod
New York
Montreal
Ottawa
Toronto
Buffalo
Detroit
Sudbury
L. Huron
L. Michigan
L. Superior
St. Paul
Minneapolis
DOMINION OF CANADA
Lake Winnipeg
Winnipeg
Regina
Edmonton
Calgary
Great Slave Lake
Great Bear Lake
Ft. Smith
Vermilion
Simpson
Mackenzie
Norman
ARCTIC CIRCLE
Dawson
Whitehorse
Fairbanks
Prince Rupert
Prince George
Fraser R.
Vancouver
Victoria
Seattle
Portland
Spokane
Helena
Butte
Boise
Cape Flattery
VANCOUVER I.
QUEEN CHARLOTTE IS.
Ketchikan
Wrangell
Juneau
Sitka
Skagway
Mt. St. Elias
Valdez
Cordova
Seward
Cook Inlet
Alaska Pen.
KODIAK I.
Nome
St. Michael
ST. LAWRENCE I.
BERING SEA
Bering Strait
Cape Mendocino

Fig. A.

HU


PHYSICAL AND POLITICAL MAP OF NORTH AMERICA
SCALE OF MILES
0 100 200 300 400 500 600
Railroads
REFERENCE
HEIGHT OF LAND
10000 feet
5000
2000
1000
500
Sea Level
Below Sea Level
Copyright, The John C. Winston Co.
Longitude West from Greenwich
GULF OF MEXICO
CARIBBEAN SEA
BAHAMA ISLANDS
FLORIDA KEYS
JAMAICA
HISPANIOLA
PUERTO RICO
CENTRAL AMERICA
SOUTH AMERICA
UNITED STATES
MEXICO
YUCATAN
BRIT. HONDURAS
HONDURAS
NICARAGUA
COSTA RICA
EL SALVADOR
TROPIC OF CANCER
EQUATOR
BERMUDA IS.
Cape Hatteras
Wilmington
Cape Fear
Charleston
Savannah
Jacksonville
Atlanta
Birmingham
Memphis
St. Louis
New Orleans
Tampa
Key West
Florida Strait
Galveston
Austin
Fort Worth
Oklahoma City
Kansas City
Denver
Santa Fe
El Paso
Grand Canyon
Los Angeles
Gulf of California
Cape San Lucas
Chihuahua
Durango
Guadalajara
Mexico
Tampico
Veracruz
Progreso
Salina Cruz
Acapulco
Belize
Tegucigalpa
Managua
Guatemala
San Salvador
San José
Colon
Panama
Panama Canal
Habana
Yucatan Channel
Santiago de Cuba
Kingston
Port au Prince
Ciudad Trujillo
San Juan
Nassau

Fig. A.

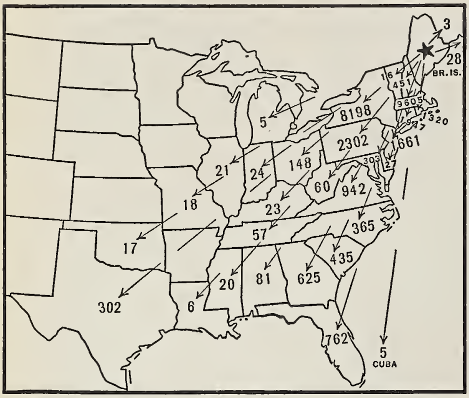

Fig. A. The arrows on this map point to the states which buy most of Maine's potatoes. The figures show the number of carloads bought by each state during a period of six months. Even Florida buys Maine potatoes. How many carloads? How many carloads of Maine potatoes are bought by the state in which you live?

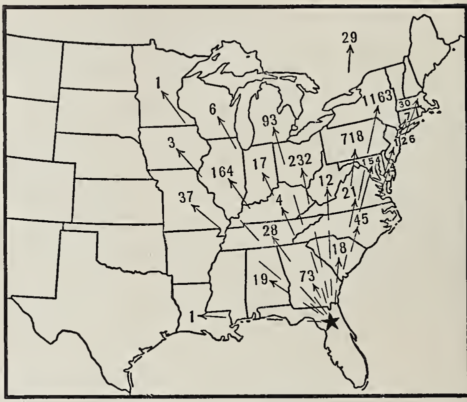

Fig. C. The arrows on the map point to the states which buy most of Florida's early or *new* potatoes. The figures show the number of carloads bought by each state during a period from April 14 to May 20. Some of Florida's new potatoes are eaten in Canada. How many carloads?

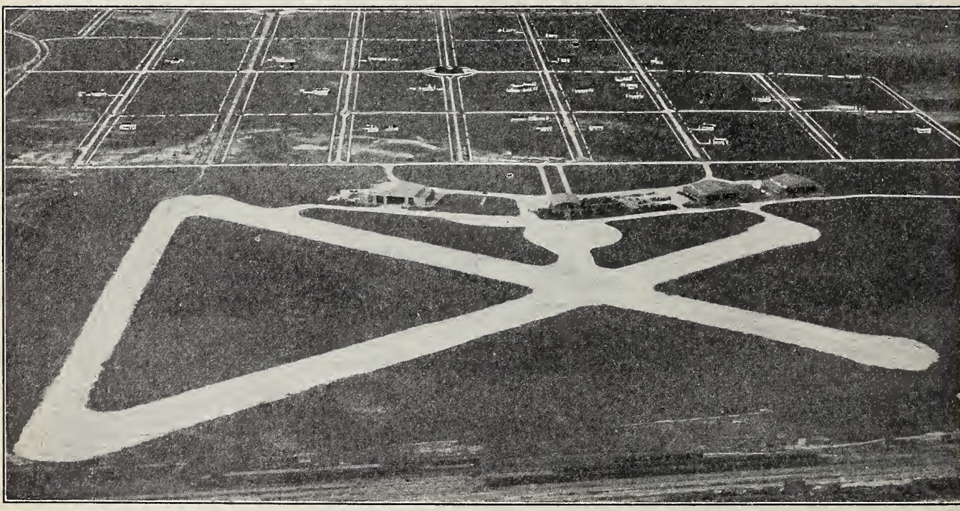

Fig. B. The Miami airport. No matter from what direction the wind is blowing, a pilot can head his plane into the wind and land on one of the broad, level paths. Our plane rose from this airport.

celery, early potatoes, cabbages, strawberries, and other garden crops? These fresh foods are being loaded into trains and boats for shipment to the northern cities. Do you suppose that the potatoes we saw starting their journey in Maine will meet the potatoes now starting northward from Florida? These early potatoes from Florida are costly. They are what we call *new potatoes.* Some of them go to Maine and some of the cheaper Maine potatoes go to Florida (Fig. 216-A). The strawberries go in refrigerator cars, with ice to keep them cool.

In the afternoon we have a good time on the sandy beach before we swim.

Fig. A. Our plane landed near this orange grove and the picker gave us several of the oranges to eat. Florida grapefruit is picked in much the same way.

We fly. We have now seen the northeastern and the southeastern corners of our country, and are ready for the thrill of going north by airplane. Our plane is waiting at the Miami airport. The small buildings of the airport are in a level, open field outside the city. As we arrive, the mechanic is testing the engine. He tries one motor, then a second, and a third. He then tries the three motors together. Everything is all right, and we step in. With a roar the three motors start. The plane moves forward, rises from the ground, and we look down on the town, the white beach, the blue sea, and the truck farms. The town is spread out under us like a very large map.

In a few minutes Miami fades in the distance and we are crossing a great swamp called the *Everglades.* All the earth as far as we can see is covered with water in which stands tall, coarse grass. The great automobile highway from Miami to Tampa shines out like a white band across the green. In less than two hours we are looking down on many houses, truck farms, a city on a bay, and a baseball field where a baseball team from New York City is practicing for the summer games in the North. We have now reached Tampa.

Oranges. We look down on truck farms and pine woods. Those many rows of dark-green spots on the light soil are orange trees. The pilot brings the plane down in an open field at the edge of a town. We land beside an orange orchard. Men are picking oranges and putting them into boxes, and loading a truck with the boxes. We pick some oranges just for fun and are given a few to eat. We ask if we may ride in the truck to town to see the orange-packing house. The good-natured driver lets us go with him.

At the packing house the oranges are first put into a machine which rolls them along before a line of girls who pick out the bad oranges. The machine then separates the oranges into different sizes and allows


POLITICAL MAP
OF
NORTH AMERICA
SCALE OF MILES
0 100 200 400 600 800
Copyright The John C. Winston Co.
Longitude 100° West from 90° Greenwich
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
ASIA
GREENLAND
(To Denmark)
ICELAND
(To Denmark)
ALASKA
DOMINION OF CANADA
UNITED STATES
MEXICO
CENTRAL AMERICA
SOUTH AMERICA
LABRADOR
NEWFOUNDLAND
BERING SEA
Bering Strait
ARCTIC CIRCLE
TROPIC OF CANCER
BAFFIN BAY
Davis Strait
Hudson Strait
HUDSON BAY
Cape Farewell
Belleisle Strait
Gulf of St. Lawrence
GULF OF MEXICO
CARIBBEAN SEA
Gulf of California
Yucatan Channel
Florida Strait
BAHAMA ISLANDS
BERMUDA IS.
CUBA
JAMAICA
HAITI
HISPANIOLA
DOMINICAN REPUBLIC
PUERTO RICO
YUCATAN
BR. HONDURAS
GUATEMALA
HONDURAS
EL SALVADOR
NICARAGUA
COSTA RICA
PANAMA
Panama Canal
ALASKA PEN.
KODIAK I.
QUEEN CHARLOTTE IS.
VANCOUVER I.
Point Barrow
Great Bear Lake
Great Slave Lake
Athabaska Lake
Lake Winnipeg
Mackenzie R.
Yukon R.
Peace R.
Saskatchewan R.
Fraser R.
Gt. Whale R.
Columbia R.
Snake R.
Missouri R.
Platte R.
Arkansas R.
Red R.
Mississippi R.
Ohio R.
Rio Grande
Colorado R.
St. Lawrence R.
Great Salt Lake
YELLOWSTONE NAT. PARK
L. Superior
L. Michigan
L. Huron
L. Erie
L. Ontario
ROCKY MTS.
Grand Canyon
Cape Mendocino
Cape Flattery
Cape Cod
Cape Sable
Cape Race
Cape Hatteras
Cape Fear
Cape San Lucas
Nome
St. Michael
Anchorage
Valdez
Seward
Juneau
Dawson
Etah
Churchill
Port Nelson
Prince Rupert
Edmonton
Calgary
Regina
Winnipeg
Vancouver
Victoria
Seattle
Tacoma
Portland
Spokane
Helena
Butte
Boise
Salt Lake City
San Francisco
Los Angeles
Denver
Santa Fe
El Paso
Minneapolis
St. Paul
Omaha
Kansas City
Oklahoma City
Fort Worth
Austin
Galveston
Milwaukee
Chicago
Detroit
Cleveland
Pittsburgh
Cincinnati
St. Louis
Louisville
Memphis
Birmingham
Atlanta
New Orleans
Tampa
Jacksonville
Savannah
Charleston
Wilmington
Norfolk
Washington
Baltimore
Philadelphia
New York
Boston
Buffalo
Toronto
Ottawa
Montreal
Quebec
Sudbury
Halifax
St. Johns
Key West
Habana
(Havana)
Santiago de Cuba
Kingston
Port au Prince
Ciudad Trujillo
San Juan
Durango
Tampico
Progreso
Veracruz
Mexico
Acapulco
Salina Cruz
Belize
Guatemala
San Salvador
Tegucigalpa
Managua
San José
Colon
Panama

Fig. A.

HU-1

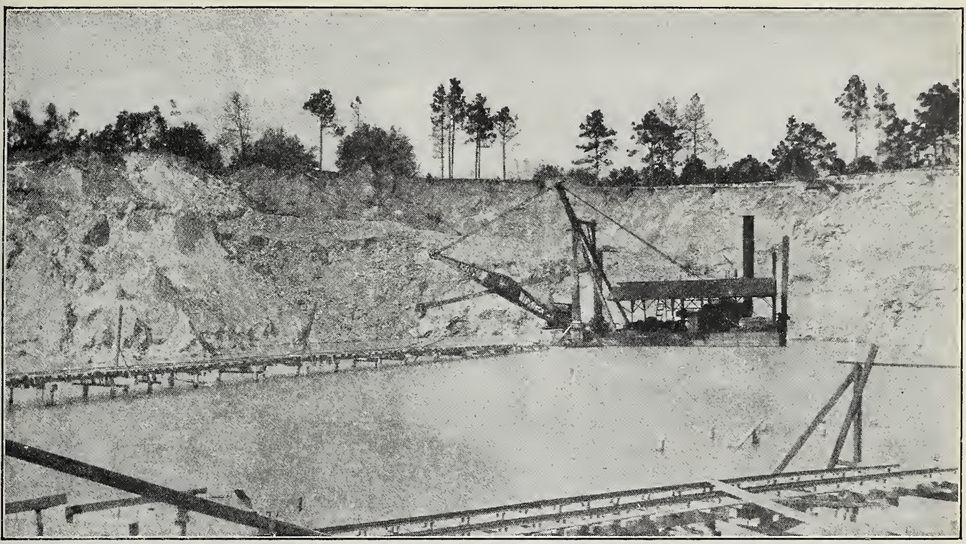

Fig. A. We saw this steam shovel at work in a big pit. It shovels up sand and gravel and small bits of phosphate rock. The phosphate rock is used to fertilize the soil (page 292).

each size to run into its own box in front of the packers. The packers wrap paper around the oranges with a quick twist, and pack the fruit tightly into the kind of boxes that we so often see in fruit stores.

Looking down on industries and forests. After an interesting hour in the packing house, we fly again to the northward. We see in the woods great pits where steam shovels are at work. You will understand what the steam shovels are doing when you have read another story (page 292). We fly over miles and miles of pine woods. The dark green tree tops make the earth seem black. Here and there is a clearing in the forest. We see houses and truck farms. The soil looks white beside the dark green of the pine trees.

Corn planting. Three and a half hours after leaving Tampa, we land in an open field near the boundary of Alabama and Florida. We have flown nearly 600 miles since leaving Tampa. We have left far behind the fields of ripe truck crops and the orange orchards. Here men are planting corn, but they stop work and come to take a look at our airplane while we look at their mules and plows.

Cotton fields and two seaports. Soon after leaving the corn planters, we look down on a shining body of water. It is a bay, and the city (Fig. 220-A) on its shore has the same name as the bay. We see a steamer coming down the bay toward the Gulf of Mexico. She is bound for Europe with a load of cotton and lumber. As we go over the city, we look down on a large school building and a baseball field. Hundreds of people are watching a championship high-school game. We do not stop, but fly on across southern Mississippi and southern Louisiana, where we see farmers with their teams getting the fields ready for cotton and other spring crops. We cross an arm of the Gulf of Mexico, whose shining water has green forests on both sides. We see a straight, narrow line of water that reaches from

Fig. A. As we flew over Mobile, Alabama, the tall buildings of the city, the water front, and the boats in the harbor looked just as you see them in this picture.

Fig. B. Three men, three mules, and three machines to plant one field with cotton. The machine driven by the first man is depositing fertilizer; by the second man is mixing the earth with the fertilizer; by the third man is planting the cottonseed.

this lake into a city (Fig. 221-A). The line of water is a canal. New Orleans is beside a river that we saw from the Lincoln Highway. The river was muddy when we saw it from the Lincoln Highway. It is muddy here near its mouth, and very much wider.

Blooming roses. After spending the night at New Orleans, we ride through the city. Trees are coming into leaf. Roses and dandelions are in bloom, and vegetables are growing in the gardens.

A map — the explorer's record. 1. From Figures 214-A, 215-A, trace an outline map of North America.

2. Put a dot in its correct place on the map for each stop that you made on your journey from Maine to New Orleans. Print its name near the dot.

3. Connect the dots by a line showing the route of your journey.

4. Use the scale of miles to measure distances between stops, and write each distance on the line in the correct place.

5. On this map keep an "explorer's record" of your journey until you reach the snowy Arctic lands.

For your notebook. Paste in your notebook a picture of an airplane. Pretend that it is your exploring plane.

Explorer's notes. 1. In your notebook keep a record of things that you see each day — the weather, what people are doing, what the country looks like.

2. If you can find pictures of the places you see, paste them in and write a sentence or two beneath, telling about the picture.

Fig. A. This picture of New Orleans and the near-by country as far south as the Gulf of Mexico was drawn. It shows, however, about what you would see from an airplane if the plane were flying very high and the weather were very clear.

FROM NEW ORLEANS TO THE SNOW-COVERED FARM

A cotton plantation. At New Orleans we change our course. The pilot heads his plane straight for Kansas City. Let us find the distance before we start. Lay a ruler on the map (Fig. 185-A). With one end of the ruler at New Orleans, let the ruler also touch Kansas City. What is the distance in inches? Now use the ruler and the scale of miles shown on the map, and tell how many miles it is between the two cities. Soon after starting, we see a big house with tall white pillars in front. It is the mansion on a large cotton plantation. Its owner is a member of Congress at Washington. Back of the mansion are several log cabins, in which live the people who work in the cotton fields. We see a tractor plowing the flat, level fields where cottonseed will be planted. We are now crossing the Cotton Belt (Fig. 256-A).

The Father of Waters and the Ozark Mountains. Again we see the yellow Mississippi. It winds back and forth as crooked as a huge snake. We cross the river near a city on its east bank. What is the name of the city? Two and a half hours after leaving New Orleans, we see another muddy river. On its banks is the city of Little Rock. In the distance to the left are mountains, and soon we see mountains ahead. For the next hour we look down on the mountainous country of the Ozark Plateau. Find this region on Figure 255-A and on Figure 222-B. There are farms and roads in some places in the valleys along the streams. In some other places there is level upland between the streams and valleys. Roads and farms are on these uplands.

Fig. A. An air view of a part of Shreveport, Louisiana. Because the river at this point winds about, it is called a *meandering* stream.

Fig. B. The forest-covered Ozark Mountains. Find these mountains on Figure 185-A.

Potato planting. At the northern edge of the Ozark country, we pass a place where potatoes are being planted. The men and teams look much like those we saw planting corn yesterday, hundreds of miles to the southward.

Planting oats. In less than an hour after seeing the potato planters, we land in a field in the level country of southwestern Missouri, beside a group of men with tractors, harrows, and seeding machines. The men are planting oats in a field that had corn in it last year. The strong little tractor pulls the harrow, and the sharp, iron teeth of the harrow make the soil fine. The drilling machine then puts the seeds into the earth.

The end of spring. As we fly northward, we see that there is only the faintest tinge of green on the land. This morning, when we left Louisiana, all was green. In half a day we have come to the end of greenness. Spring has not yet come to this part of the country. From here northward all is brown and dead.

As we fly over Kansas City, we see the same yellow river that we saw at Omaha on our automobile journey. We see other things like those we saw at Omaha, for Kansas City, like Omaha, is a Corn Belt city.

After lunch at the Kansas City airport, we start for the twin cities of Minneapolis and St. Paul. In which direction do we go? Again lay your ruler on the map, this time on Kansas City and Minneapolis. The scale of miles will tell you how long this leg of our journey will be. We see almost no plows this afternoon as we cross the Corn Belt, for we are getting back toward the land of winter.

Snow again. As we cross the Lincoln Highway, we see drifts of snow behind the fences, patches of snow behind the barns and in other shady places, and before we reach St. Paul the ground is covered with snow. Those black specks that remind you of pepper on mashed potatoes are boys and girls coasting. As we fly over St. Paul and Minneapolis we again see the Mississippi River; and there is ice on it. What a long river it is, to be seen at so many

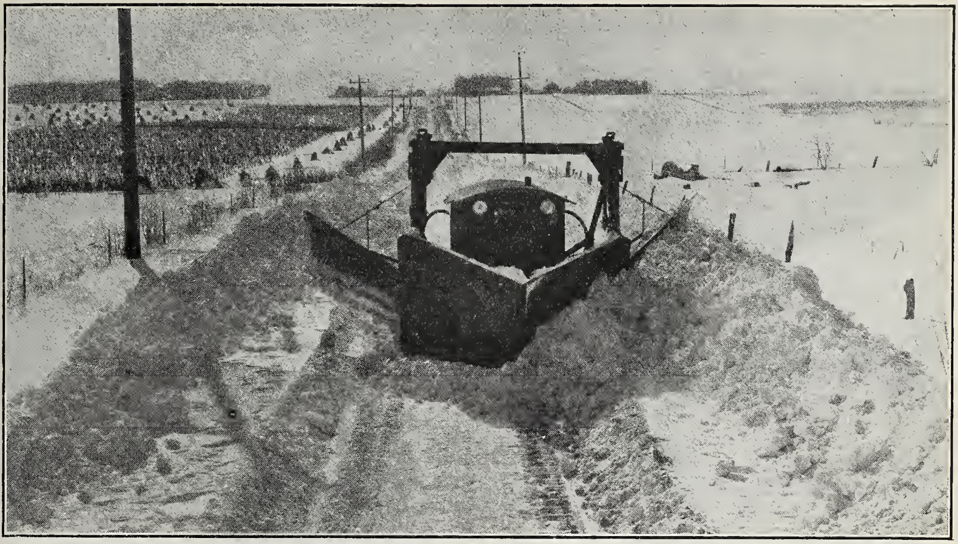

Fig. A. Mr. Olsen's farm is on both sides of the road. The farm buildings are at the top center of the picture. What is the tractor doing?

points on our journey! In this part of the river there is a great falls, and large factories and flour mills stand near the falls. Of course you want to stop at the mills and factories, but our pilot wants to spend the night with his father and mother in his boyhood home on a farm a hundred miles north of Minneapolis.

A dairy farm. At sunset we land at an airport near a small town and motor out to the farm. Mr. and Mrs. Olsen make us welcome and give us a very good supper. In the early morning we go with Mr. Olsen to see the barn. Twenty cows stand in their stalls eating breakfast. They have hay from the big mows in the upper part of the barn, corn silage from the round silo, and meal which Mr. Olsen makes by mixing together cottonseed meal from Texas, bran (which is the husks of wheat), and corn that grew on his farm. Taking care of cows is the winter work of Mr. Olsen and his son Jan. In summer they grow crops of corn, hay, oats, and wheat. In winter they feed to their farm animals everything they have raised except the wheat. They milk the cows and put the milk through a little whirling machine, called a *separator*, which takes out the cream. Jan takes the cream to a creamery two miles distant, and there it is made into butter, with the cream from twenty-five other farms. Every day carloads of butter go from this part of the world to almost every big city that we have seen on our airplane trip. Mr. Olsen says that he feeds pigs with the milk that is left after the cream is taken out. The Olsens sell cream, wheat, and pigs.

Put regions on your map. You have now passed through several natural regions. Within these natural regions are a number of different agricultural belts. Locate each of the following on your map:

a. Corn Belt.
b. Truck-Farming Belt.
c. Cotton Belt.
d. Dairy Belt.
e. Wheat Belt.

Fig. A. In the Great Northern Forest. By airplane, as we are traveling, or by sled and dog team are the only two ways of carrying goods in this cold, forest country.

FROM MINNESOTA TO ESKIMO LAND

An international boundary. After leaving the hospitable Olsen home, we fly to the northwest, cross the boundary between the United States and Canada, and come to a big city. Those large, high buildings are grain elevators. They are full of wheat. What is the name of the city? We might call it a wheat city, because the country to the west is the Wheat Belt, just as the country to the west of Chicago is the Corn Belt, and the country near Austin and Fort Worth, Texas, or Vicksburg, Mississippi, is the Cotton Belt.

The Great Northern Forest. We stop at Winnipeg only long enough for the mechanic to examine the motors thoroughly. He puts in enough gasoline and oil to last from Winnipeg to Churchill, a tiny town on the shore of Hudson Bay. Again, with your ruler and scale of miles, find the length of this hop. For half an hour after leaving Winnipeg we see farms. Then we begin to see scattered trees, then more trees, then forest — nothing at all but forest. We strain our eyes to catch a glimpse of a farmstead. Not a single farm appears. For miles and miles and miles we fly over forest and snow, frozen rivers, and white, frozen lakes. Once we see a moose running; and twice we see smoke coming out of a few tents that are the winter homes of Indian fur hunters. At one place we see two log houses and a larger building beside a river. It is a trading post, the store where the fur hunter buys his supplies in exchange for his furs.

Hudson Bay. The trip from Winnipeg to Churchill, on the edge of Hudson Bay,

Fig. A. As our plane neared Eskimo Land, the Great Northern Forest began to look more and more as you see it in this picture. How is the forest different here from that in Figure 224-A? Why is it different?

has taken five hours. The plane lands near a few dozen houses, and a tall grain elevator that will hold nearly three million bushels of wheat. You may think that Churchill is a very small town, but it is actually the most important port on Hudson Bay. The bay, as we see it, is covered with ice and snow. The mass is frozen so hard that no ship could possibly move in or out of the harbor at this season. The thermometer is below zero as we land. In our hotel we fall asleep between thick woolen blankets, and we feel very far indeed from the orange groves of Florida and from the farms, villages, and cities that we saw such a short time ago.

On to Eskimo Land. In the morning, with overcoat collars turned up and wearing thick mittens, we see all of Churchill. By eight o'clock we are off again. We are glad the airplane has a tight little cabin to keep us from freezing to death.

As we go northward from Churchill, we notice a few small trees along the streams, but there is almost no forest. We are now passing the northern limit of forest. Find this line on the map.

Mile after mile we fly on over the snow. Once we see the tents of Indians who are hunting the caribou. Here and there a few bushes of birch or arctic willow stick out of the snow, and here and there some rocks are to be seen, but never a farm, a road, or a village. It is nearly a thousand miles, and a long day of flying, from Churchill to the shore of the Arctic Ocean, where we see the blue water. We turn and fly along the shore. Some parts are covered with blocks of ice as big as a table or a house or a baseball field. That tiny speck that moves along is the head of a swimming polar bear. Now we see a dog sled and Eskimos coming home from a seal hunt, for the shore of the Arctic Ocean is the heart of Eskimo Land. You read about the Eskimos on pages 56–73. What can you tell about the things we saw and did in our two days' stay in this little village of snow houses?

Many kinds of weather. In about five days we have passed from winter through spring to the land of truck harvest, and then we have returned to winter. There is another kind of land in our continent of

Fig. A. The polar sea during the long summer day. The time is midnight but the sun is shining.

North America that we have not yet seen. That is the hot land, where there is no frost; the land where bananas grow and fire to heat houses is unknown. If we had flown south from Florida or from New Orleans, we would have reached the hot lands quickly (page 465).

A statement to prove: North America has
many kinds of climate
many kinds of soil
many kinds of occupations
many kinds of products.

To prove the statement, you may use facts from the book and facts that you find elsewhere; you may use pictures, maps, graphs, charts, and your own drawings.

A game of sorting pictures. Number ten lines down your notebook page. Choose a leader to call the names of the following word pictures. You will write on the proper line the name of the place where you saw the picture; as, Maine or Miami.

1. Outdoor automobile camping.
2. Uninhabited forest.
3. Potatoes hauled over snow.
4. Sea bathing on a sandy beach.
5. Frozen ground and cold winds.
6. Picking strawberries.
7. Miles and miles of snow.
8. Palm trees and flowers.
9. Planting corn.
10. People playing golf.

March weather. Copy from your book a few words that tell the kind of March weather there is somewhere in Maine; in Florida; in Missouri; in Minnesota; in northern Canada. Compare your sentences with those of your classmates. Find the latitude of each place.

Things for the class to consider. 1. How may maps be useful to air pilots, to automobilists, and to travelers in a strange city?

2. Why do I need to learn to use and to read maps this year?

3. Shall our class collect maps to be used in an exhibit? We can use maps that pupils make or cut from newspapers, magazines, and railway guides.

Maps are kept best when pasted to heavy paper, to cheesecloth, or coarse muslin; or they may be laid flat between the leaves of a book.

Fig. A. The landing of Columbus on San Salvador, one of the Bahama Islands, October 12, 1492. Find Columbus in the picture. He is taking possession of the land in the names of the King and Queen of Spain.

THE EUROPEANS MAKE HOMES IN NORTH AMERICA

PLACE NAMES AND EARLY SETTLEMENTS

What does a map tell you? A boy looks closely at the soft ground and says, "A man has been over this road, and a boy and a girl and a big dog." How do you suppose the boy knew this when he had not seen them?

Suppose you look at a map and see that an island southeast of the United States is named Puerto Rico (in English, "rich port"), and that a country in Central America is named Costa Rica ("rich coast"), and that there are many more names that came from Spain, on the maps of the West Indies and Central America and Mexico and even in the southwestern part of the United States. What people do you think founded these towns? Some of our towns with Spanish names are San Antonio, Texas; Santa Fé, New Mexico; San Francisco and Los Angeles, California.

Now ask your teacher to show you place names on the map of the eastern part of the United States. New Hampshire was named for Hampshire in England.

Fig. A. All the land which is shaded in this map at one time belonged to Spain.

Plymouth, Massachusetts, was named for Plymouth in England. The James River was named for King James of England; Maryland for Queen Mary of England; Carolina for Queen Caroline; Georgia for King George; New Jersey for the Island of Jersey in the English Channel. Susquehanna and Chesapeake ("big salt bay") are Indian names; but look at the map and see the names of the capes at the mouth of Chesapeake Bay. The big creek that flows past Wilmington, Delaware, is named Christiana Creek in honor of a Swedish queen. New York has many Dutch names like Van Cortlandt, Roosevelt, and Stuyvesant. New York was first named New Amsterdam after a city in Holland. When the English got possession of the city they changed its name to New York, after York, a city in England.

The Spaniards chose the warm lands. The Spaniards came over and made homes or settlements in the New World while Columbus was still exploring. They founded San Domingo City in 1496, and in a short time they had many more settlements in the West Indian Islands, in Central America, and in Mexico. They also settled the city of St. Augustine, Florida, in 1565. To this day, Spanish is the chief language spoken in all of the countries of North America that are south of the Rio Grande, except one small British colony. Write in your notebook a list of the names of these countries south of the Rio Grande. Spanish is also spoken in the islands of Cuba, Puerto Rico, and in the Dominican Republic. Perhaps you can guess why French is spoken in Haiti and English in Jamaica.

Land that was not wanted. The other peoples of Europe were in no hurry to cross the stormy Atlantic Ocean to make homes in the new continent. Fishermen from Europe came to the edge of the new continent, caught fish, and went back dozens and scores of times before any tried to make homes in the new forest-covered land. The visits by fishermen began soon after John Cabot, in the service of England, discovered (1497) that there was good fishing off the coast of Newfoundland. The next year English vessels came there to catch fish. The Portuguese came in 1501, the French in 1504, and the Spanish soon after. In those days meat was very scarce in Europe; so the people were glad to get codfish from Newfoundland. In a single year (1550) 150 vessels came from one city in Portugal, and 200 came from Spain. Europeans came over every year, fished for a few weeks, dried their fish on wooden racks along the shores of Newfoundland, and sailed home with a year's supply of dried codfish. Men fished, grew old, and died. Their sons and grandsons followed them,

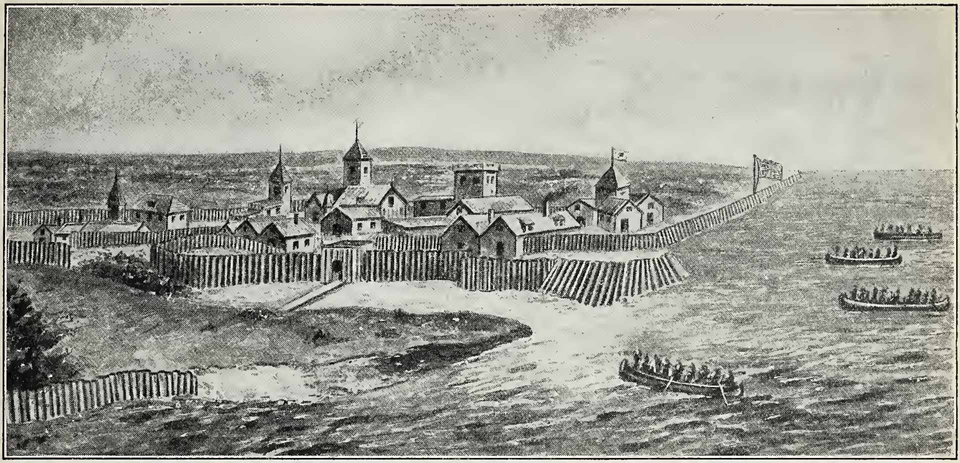

Fig. A. The settlement at Jamestown. The rows of posts form a *stockade*. Why did the settlers build a stockade?

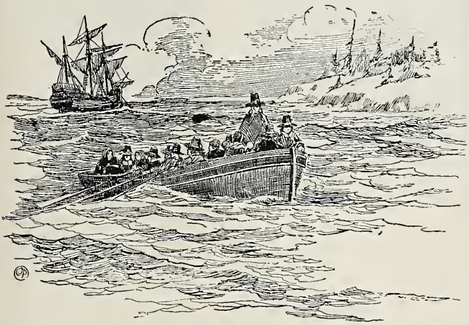

Fig. B. The landing of the Pilgrims. The *Mayflower* is anchored offshore.

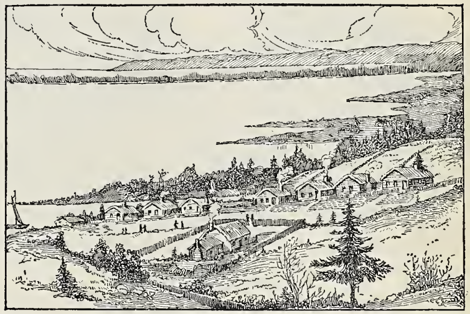

Fig. C. The town of Plymouth in 1622. The settlers lived in the log houses which you see in the picture. The large log house surrounded by a stockade was the home of Governor Bradford.

but not yet did any try to make a home in the forests on these cold shores.

North Europeans chose the lands with cold winters. At last, in 1607, some Englishmen settled at Jamestown, near the mouth of the James River in Virginia. (How many years after Columbus' great discovery was this?) The settlement was called the Virginia colony. In 1620 the Plymouth colony, of which you may have read, came to Massachusetts. Because these people came from England, the colonies belonged to England. Several other European countries sent colonists to the Atlantic coast of North America.

Challenge your neighbor in four languages. Make a list of five Spanish names given by early settlers to places in North America; of five English names; of five Dutch names; of two Indian names. Two groups of children challenge each other. A child from the first group may call "English," and a child from Team 2 must answer, "Jamestown" or some other English settlement name. To make the game harder, the child from Team 2 may be required to write Jamestown on the board, to find the place on the wall map, and to tell something about it.

Tell a story. Tell a story that might have been told by a fisherman from Europe who fished in American waters while Columbus was still alive.

Fig. A. After you have read the story on pages 230-234, write a paragraph describing the things which you see in these pictures.

HOW THE WHITE SETTLERS USED THE LAND

The new farm and the log house. Most of the white settlers in the forests along the Atlantic coast were farmers. To get a farm, the new settler had to cut down the trees and make fields in the forest clearing. This was long, hard work. The limbs and branches of the trees had to be burned, and often even the big logs had to be rolled in piles and burned. Some of the logs were split into rails to make a fence around the field. This, too, was hard work; rail splitters used a heavy tool (maul) and iron wedges.

The settlers cleared the land in winter, planted corn among the stumps in spring, and by August or September the new crop of corn was ready for food. When his farm was started and food was growing, the settler could give more time to making a house.

Some of the smaller logs were used to make the log house (Fig. 230-A). The spaces between the logs were filled (chinked) with stones and mud. The roof was made of shingles split from short lengths of log with an ax. The chimney was of stone if the settler had lime to make mortar, but often he had to make a chimney of sticks and mud. Often the settler's cabin had only a floor of earth, because boards for a floor could be made only by splitting a log in two pieces and afterwards cutting away the wood with an ax, until only a board remained — two boards from one log.

Indian corn. The early settlers would have had an even harder time had it not been for Indian corn. This crop was

not known in Europe. It yielded more than any grain the settlers brought from Europe. Corn even helped them to hunt deer. Many early settlers went into the woods to hunt with musket and powder-horn and a quart or two of parched corn in a little sack for food. Parched corn is made by heating the grains in a pan or skillet until the corn is cooked. The hunter ate the grains of parched corn while he hunted for squirrels, raccoons, and deer. When he shot a wild animal he would skin it with his hunting knife; cook its meat on a sharp stick over a fire; and, after eating, he would lie down and sleep beside an open fire. If he had good luck, he might get a deer to bring home. The family then had meat to eat with the corn bread and the cabbages which his wife had grown in the garden.

The animals helped. It was easier for the white colonists to make a living than it had been for the Indians, because the white man brought with him his great helpers, the horse, the cow, the sheep, the pig, chickens, ducks, and geese. The horse pulled the plow and the wagon. The colonist could, therefore, have a corn field much larger than the Indian who had only his own strength for the work. The cow gave milk, and there was also butter and cheese, and leather for making boots and shoes. The pig mother led her family into the woods in the spring. With their stout noses they rooted up grubs and roots. They ate seeds, grass, and berries; and in the autumn, when acorns and hickory nuts were ripe, they ate until they could hold no more, and so grew very fat. When cold weather came, the pigs became the family's ham and bacon, sausage, and lard. A little corn was fed to the breeding stock that was kept over the winter, but the pork might almost have been called a forest product.

Fig. A. Some of the early colonists would have had a very hard time of it indeed if friendly Indians had not brought them food. What is the chief food which the white man got from the Indian?

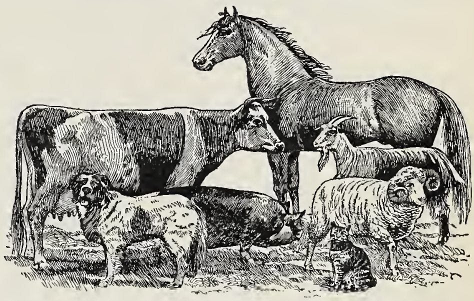

Fig. B. The white man's helpers. Name each helper. Why are they called domestic animals? How are they helpful to man?

The sheep gave wool, and with it the colonist's wife could spin wool yarn and weave woolen cloth. This she did in the winter while her husband was cutting down the forest, clearing the fields, splitting rails, making fences to keep the cows and horses in the pasture and out of the corn field. The chickens gave eggs and meat, and the ducks and geese gave feathers for pillows and feather beds. These were much softer than the husk mattress, and kept the family warm on cold winter nights. As for roast duck — well, we know what they did with roast duck and roast goose!

Using the forest. Slowly the colonists learned how to live in the woods and get

Fig. A. These settlers are seeking homes farther west.

Fig. B. This Indian mortar is made of wood. The Indians used the mortar in which to pound parched corn.

along well with little. They used the few things they had in clever ways, now almost forgotten. If they wished to tie or bind things, they would often take a hickory limb and twist it and tie knots in it. Today we use rope or wire instead of hickory branches. It is said that a colonist could build a log house completely with the aid of an ax alone.

Some of the doors had wooden hinges and a wooden latch. The latch was on the inside, with a string coming out through a hole in the door. When the string was pulled, it lifted the latch and the door could be opened. Hence we say to a friend, "My latchstring is always out," which means, "Come to my house, pull the string, lift the latch, open the door, walk in, make yourself at home." The window was often only a little hole in the south wall. To close the window, a sliding board was pushed over the hole. In keeping out wind and cold, the board also kept out light. Sometimes the window had oiled paper to let the light in. In 1745 there was not a single glass window in Kennebec, Maine.

How the colonies grew. When the boys and girls grew up and married, they went back into the woods to make the new home where there was plenty of land. If there were already people in the neighborhood, the neighbors all came and made a party by helping the newcomers make a log house, chop out a clearing, and split rails to make a fence. Thus the settlers from the Atlantic coast went back into the forest and founded new communities.

Sometimes the new settlers would go out with a horse, a cow, some sheep, and a pig or two. The wife rode the horse, with her household goods tied in packs and fastened to the saddle. Though she had but little, it was enough for beginning life in the new cabin. If the young people were rich, they might have two horses to pull a wagon in which their household goods were carried. Often they traveled with a cow tied behind the wagon. Sometimes they lived for weeks in the wagon while making a long journey to the new home.

The mill on the creek. All up and down the Atlantic coast the colonists in almost every neighborhood found many little streams with waterfalls in them. There

Fig. A. The woman is grinding grain as in Bible times. The grain is placed between the two stones. The turning of the upper stone on the lower grinds the grain into flour.

Fig. B. A *gristmill* on the creek. In this gristmill the force of the swiftly flowing water turned the big mill wheel.

some settler who liked machinery would build a mill in which to grind grain. First he would make a dam across the stream. By this means he led the water through a little canal or mill race and let it fall on a big wheel. The weight of falling water turned the wheel, and the wheel turned the simple machinery that ground corn into meal and wheat into flour. The miller usually got a sixth of his neighbor's grain for doing the grinding. The colonist or his boy would ride to the mill, taking a bag of corn or wheat which he put across the saddle in front of him. Neighbors often met at the mill and visited while waiting for their grain to be ground. The mill with the water wheel was much better than the Indian's hand mortar (Fig. 232-B). The colonist's wife liked corn meal better than the parched corn that the Indians often ate.

Some of the millers fastened a long, straight saw blade so that their water wheel would run the saw up and down like a huge handsaw. The moving saw cut a log into boards when the log was pushed against it. These sawmills were a great help. A man could haul his log to the sawmill and have it made into ten or twenty boards to use in making the outside of his house or barn, or he could have the log made into beams for the framework of his buildings.

How rivers located farms. Thus for a hundred and fifty years the sons and grandsons of the colonists made new homes in the woods. They settled most of the land between the ocean and the rough land of the eastern highlands. We crossed these highlands easily in our automobile because we now have good roads, but in the early days of the roadless forest (page 237) these mountains stopped the settlers for nearly two hundred years. Even if they had gone into the mountains and found land for farms, how could they have taken their crops to market? The farmer needed to be near a river in order to ship his wheat, his corn, or his pork. Only then could he send these things to Europe or the West Indies and get a little money from their sale. Before there were railroads, the American farmers sent flatboats loaded with grain and pork down rivers

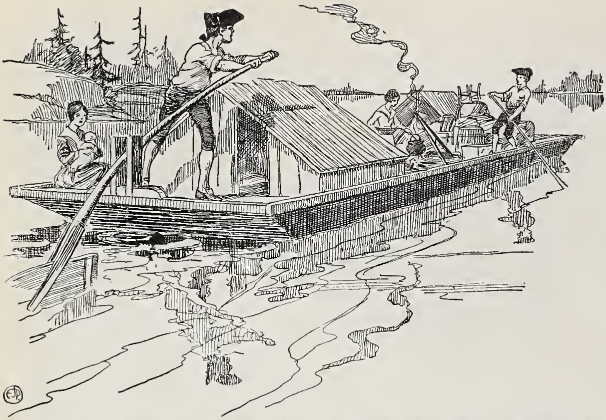

Fig. A. Before we had steamboats, flatboats were used on nearly all the rivers in the eastern part of our country. Such boats, of course, could only go downstream, gliding with the current.

that are not now used by large boats at all; such rivers as the upper Delaware, the Susquehanna, the Potomac, the James. If a farmer lived within thirty or forty miles of one of these streams, each year he could haul a few wagonloads of produce down to the river and load a flatboat, which took his produce to New York, Philadelphia, Baltimore, Georgetown (now a part of Washington, D. C.), Richmond, or Norfolk. Thus he sold his crop for money. Business, you see, kept most of the people from going on into the mountains where they could not use the rivers.

When I was a boy I saw a flatboat. It carried several hundred bushels of wheat. A man stood on each end of the boat as it went through the rapids down a branch of the Potomac River known as the Shenandoah. The flatboat business is now almost entirely stopped because the railroads and trucks haul freight so cheaply.

Acting scenes. Act some scenes to show how our country was settled. Some of the characters might be New Settler, Miller, Indian, Neighbor. You could act forest scenes, farm scenes, scenes at a mill, and on a river.

A debate. Let a river in colonial times debate with a modern automobile road the question about the usefulness of each to man. Read the text very carefully to make sure that you have not missed a single point.

A letter. Write a letter such as a young wife might have written to her sister a few weeks after she had gone to her new farm home in a new neighborhood in the year 1750.

Pretending. Pretend that you are a tree, and tell a story about how you became part of a log house. You might write this story. Perhaps you could use it in your language class also.

A dialog. Suppose the animals on this new farm should each try to prove that he was most important. What might each say?

The good old days. "Alas, things are not as they used to be in the good old days," said the flatboat. Tell why the flatboat said this. The very same thing was said by

the rail fence	the forest
parched corn	the log cabin
the raccoon	the latchstring
the deer	the pack horse
the Indian	the country miller
the pig	the Potomac River

Tell why each of these said it.

Map work. Below is a list of rivers used by the colonists to ship their products; there is also a list of cities to which the products were sent. Using the map (Fig. 185-A), show how farmers could send their products down these rivers to the cities named. Then show how the cities could send the products to Europe.

Rivers	*Cities*
Hudson	New York
Delaware	Philadelphia
Susquehanna	Baltimore
Potomac	Georgetown
James	Richmond
	Norfolk

THE TEMPTING LANDS BEYOND THE MOUNTAINS

The grand French scheme. In those days France and England were two European countries wanting the same thing. Each wanted many colonies. Each wanted the land beyond the Appalachians. For several generations the mountains had stopped the colonists along the Atlantic coast from going west; but a few explorers had been across the mountains, and both the English and the French thought it would be a fine thing to get this center of the continent. The French were the first really to make a plan to get possession of the Mississippi Valley.

After fishing near the mouth of the St. Lawrence River for more than a hundred years, the French settled on that river, and to this day many of the people in the Canadian province of Quebec speak only the French language. In the early days the French explorers went with the Indians in canoes along the Great Lakes, and were the first white men to see the upper Mississippi. Find, on the map (Fig. 357-A), Detroit and Marquette; they are both French names. Examine the physical map (Fig. 185-A). Is there a lowland west of the Appalachian Highlands? Trace it with your finger as far as possible. Trace the waterway from the St. Lawrence to Lake Michigan. Find the places where the shortest land journey, or portage, would take the explorer to a branch of the Mississippi.

The English had the Atlantic slope, but the French saw that the Mississippi Valley was a richer land. The grand French scheme was to get the heart of North America by settling the St. Lawrence Valley and the Mississippi Valley and to hold all the land west of the Appalachians. They started with settlements at Quebec and New Orleans. On the map

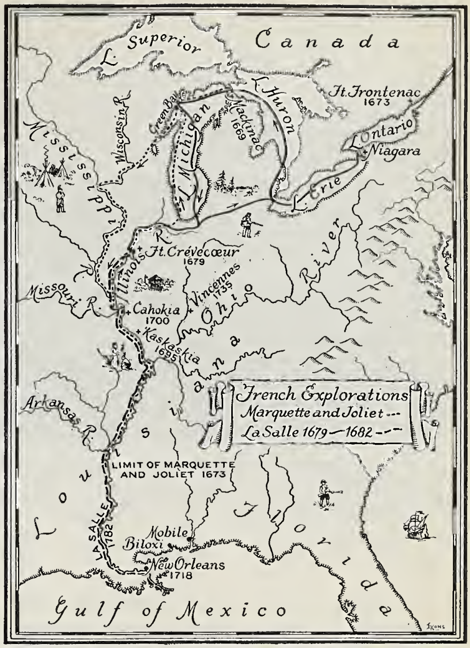

Fig. A. Map of the "grand French scheme." Trace the route of each explorer. Locate several French settlements with French names.

(Fig. 185-A) you will find, along the Mississippi River, cities with French names: New Orleans (after Orleans in France), Baton Rouge ("red stick"), St. Louis, St. Paul.

The French also saw that the Ohio Valley was good land and they wanted it for part of their empire; so they built a fort at the place where two rivers come together to form the Ohio River. They called it Fort Duquesne.

George Washington's dangerous journey. The English settlers did not like what the French had done. They, too, wanted this land, so the governor of Virginia sent a note to the French at Fort Duquesne (Pittsburgh) telling them to get out of the Ohio Valley. George Washington, a young man twenty-one years of age, took the note to the French. Accompanied by seven men, Washington

Fig. A. Looking through the historic Cumberland Gap in the Cumberland Mountains, Kentucky. Tell a story about American history such as this gap might tell; and also about one family that passed through the gap.

left Williamsburg, Virginia, near the mouth of the James River. In thirty-five days the party reached Logtown, near Pittsburgh. Then for four days, through rain, snow, and swamp, they followed the Allegheny River to a place called Venango, forty miles south of Erie, Pennsylvania. The journey ended fifteen miles from Lake Erie.

After delivering the note to the French authorities, Washington and his companions left for home December 16. The return journey was full of danger and hardship. At the beginning they went downstream by canoe through rocks and floating ice. Then they tried pack horses. The ground was rough and frozen, and the horses went very slowly. After three days, Washington went ahead on foot with one companion. An Indian guide misled them and tried to shoot them. They escaped and reached the Allegheny River, which was high with flood. The men built a raft to carry them across. Washington was nearly drowned when the floating ice upset the raft. They finally reached the hut of a Scotch fur trader, named Frazier, on the Monongahela River. A few miles farther up the Monongahela, Washington bought a horse and rode it home. It took him thirty days to make this journey. As he went up the Monongahela in January, Washington met many *emigrants*, as they were called, going west to make new homes. Think how difficult must have been that journey for those brave people.

Soon war came between England and France — the French and Indian War. The English got possession of Canada and the Ohio Valley.

The settlers' wagons cross the Appalachians. Settlers from the Atlantic slope again started westward. If possible, they went in wagons. Many had already gone from eastern Massachusetts over the hills into a river valley in central Massachusetts, and from this valley they went over more hills into the valley of the Hudson and settled eastern and northern New York. From southern Pennsylvania the settlers went in their wagons southwestward through Maryland and Virginia. They followed a great opening in the mountains, called the *Great Valley* (Fig.

Fig. A. This picture shows the different methods of transportation used by the early settlers who went west over the Oregon and the California trails. How many methods of transportation can you name in the picture?

278-A). In this way the people of Pennsylvania settled western Maryland and northern Virginia. From the Great Valley a gap, called *Cumberland Gap,* opens a gateway near the southwestern corner of Virginia. Through this gap, wagons could go on into the land that is drained by the Ohio River. The wagons of thousands of Virginia people rattled and bumped through this gap in the mountains. The settlers were going from Virginia to settle Kentucky.

Down the Ohio in flatboats. Other settlers from the East crossed central Pennsylvania in wagons (Fig. 232-A) to Pittsburgh. Here some of the emigrants built boats (Fig. 234-A) to take them down the Ohio River. These wide, shallow boats, called *flatboats,* were much like those that had been in use for a hundred years on the eastern rivers. The flatboats could go downstream easily, but the Ohio River was so swift that the boats could not come back. The farmers of western Pennsylvania, southern Ohio, southern Indiana, and Kentucky raised crops of wheat which they took down the river to the French city of New Orleans. They grew corn and fattened pigs, slaughtered the pigs, and took cargoes of bacon and ham in their flatboats down to New Orleans for export to Europe.

Walking home from New Orleans. As no boatman could sail, row, or pole a boat up the deep, swift, and crooked Mississippi, the boatmen knocked the boats to pieces at New Orleans and sold the pieces for lumber. Putting the gold and silver they had received for their produce into their pockets, they walked hundreds of miles through the forest back to their homes in the Ohio Valley. Abraham Lincoln, who was born in 1809 in Kentucky, made a journey down to New Orleans in 1828 in one of these flatboats, and walked back to his home in Illinois, as hundreds and thousands of others had done for years. If they got goods from over the sea, the goods had to come over the Appalachian Mountains and down the Ohio.

The journey of Lewis and Clark. In 1763 France gave up Canada to England.

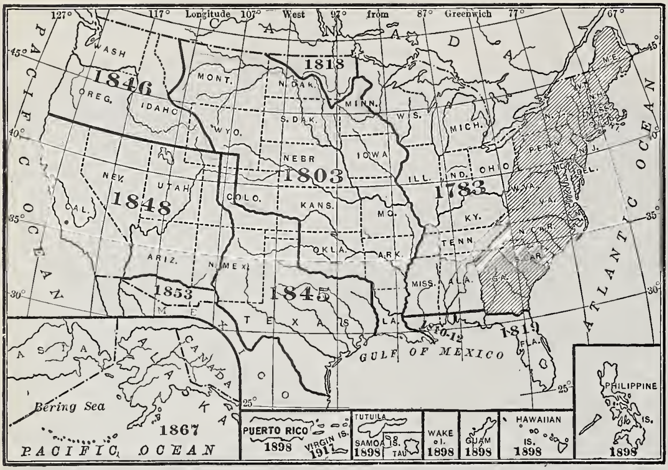

Fig. A. This map shows how the United States has grown.

She also gave up her claim to the Ohio Valley and she gave New Orleans and Louisiana to Spain. Figure 238-A shows how large Louisiana was in those days. In 1801 this territory was given back to France and she sold Louisiana to the United States for $15,000,000. That was a very fortunate land sale for us. We paid about three cents an acre for the land. It is dated "1803" on Figure 238-A.

Thomas Jefferson was President at that time, and, although he knew very little about the new land, he thought it was worth the money to get New Orleans and a free outlet to the ocean for the country west of the Appalachians. The next year he sent Captains Meriwether Lewis and William Clark, with a party of forty-six, to explore the new possessions. They left St. Louis in rowboats, May 14, 1804; Kansas City, June 26; the mouth of the Platte, July 26. They spent the winter in North Dakota; started on again, April 7, 1805; reached the mouth of the Yellowstone River, April 26; went up the Yellowstone and saw the Rocky Mountains, May 26. They left their boats, got horses from Indians, and crossed the Rockies, August 12. They would probably have died but for the help of friendly Indians. They reached the mouth of the Columbia River, November 15, 1805; spent the winter there, and got back to St. Louis, September 23, 1806.

Lewis and Clark had great things to tell of Indians, of grizzly bears, prairie dogs, and antelopes, and of a great, wide, treeless country with good grass, waiting for settlers. They set the whole country to talking of the West—the great West—the West we saw on our automobile journey and our air journey.

Some facts and reasons. 1. Tell all you can about the Appalachian Mountains, and colonists moving west. What pictures in this book will help to show what you mean?

2. Why did Lewis and Clark and all the other explorers travel along rivers?

3. Tell about rivers and home makers in Colonial times.

Building up the map. 1. Make a list of the states that touch the Atlantic Ocean (Fig. 185-A).

2. Make a list of the states between the Appalachians and the Mississippi River.

3. How did Spain happen to own Florida? When did Florida become part of the United States?

4. Make a list of the states cut from the Louisiana Purchase (Fig. 238-A). Use the Appendix, page A-10, to find the total number of square miles in these states.

5. Find the land gained by the United States in 1845; in 1846; in 1848 (Fig. 238-A).

6. Along the lower margin of the map (Fig. 238-A) are little maps of other lands that are part of the United States today. Name these lands. Find them on the world map (Fig. 178-A).

7. Write sentences telling how each new piece of land shown on Figure 238-A was acquired.

UNLOCKING THE NEW LANDS

The steamboat on the Mississippi River. In the year 1812 a great event happened. A little tub of a steamboat managed to travel fast enough to go up the Mississippi from New Orleans to Natchez, Mississippi, at the rate of three miles an hour. She made nine miles going downstream.

We may well say that this little boat started a revolution. The word *revolution* means "great change." The steamboat made a great change in the way men traveled and traded. In 1817 a steamboat began to make regular trips from New Orleans to Louisville and back. Before this, the little trading post at St. Louis, and all other places along the Ohio and Mississippi, received only a few things by flatboat from Pittsburgh. Now goods were sent from New Orleans by steamer more cheaply, much more cheaply. The Mississippi now became a *two-way* route. Since boats could go up as well as down the Ohio and the Mississippi, the settlers were greatly helped in reaching their new homes. Make a list of the states that settlers could reach from Pittsburgh by steamboat. The steamboats on the Mississippi and its branches helped the frontiersman to settle the valley of the great river much more quickly than his fathers and grandfathers had been able to settle the Atlantic slope. Page 488 shows how rapidly the Mississippi Valley became states.

The race to build canals — another revolution. In less than fifty years the central part of North America had three revolutions in the way goods and people were carried. Each revolution made a great difference in the ease and speed with which people settled the country. The first, as we have seen, was steamboats on the rivers. Canals were the second revolution.

As soon as trade began to go over the Appalachians to the new settlements in the Ohio Valley and along the Great Lakes, the people of New York, Philadelphia, Baltimore, and Washington made plans to build better roads, and even canals, across the mountains. The people of each port wanted to get the trade of the new settlements beyond the mountains.

George Washington was president of a canal company that set out to build a canal from Washington, D. C., to the Ohio River. It was called the Chesapeake and Ohio Canal. The company built the canal as far as Cumberland, Maryland, at the foot of the Appalachian Mountains. It was used for more than a hundred years.

The Erie Canal wins the race. But New York really won the canal race. Nature helped her to win, because Nature made the Mohawk Valley. That valley opens the lowest passageway in the highlands to be found anywhere between the St. Lawrence River and northern Georgia. Look at the map to prove this. The city and state of New York built the Erie Canal. The canal was opened in 1825 with a great celebration. The governor of New York went in a boat on the canal from Buffalo to New York. He took with him a cask of water from Lake Erie. At the end of his journey, the governor poured the water from Lake Erie into the New York Harbor. This was to show the union of the two bodies of water.

What the Erie Canal did. It was indeed a commercial union. Farmers who lived within thirty or forty miles of the shores of the Great Lakes could now take their grain to the shore of Lake Erie or Lake Huron or Lake Michigan, and send it to New York by way of the new canal very cheaply indeed. That gave them higher prices for their grain, so the shores of the lakes became important, just as the banks

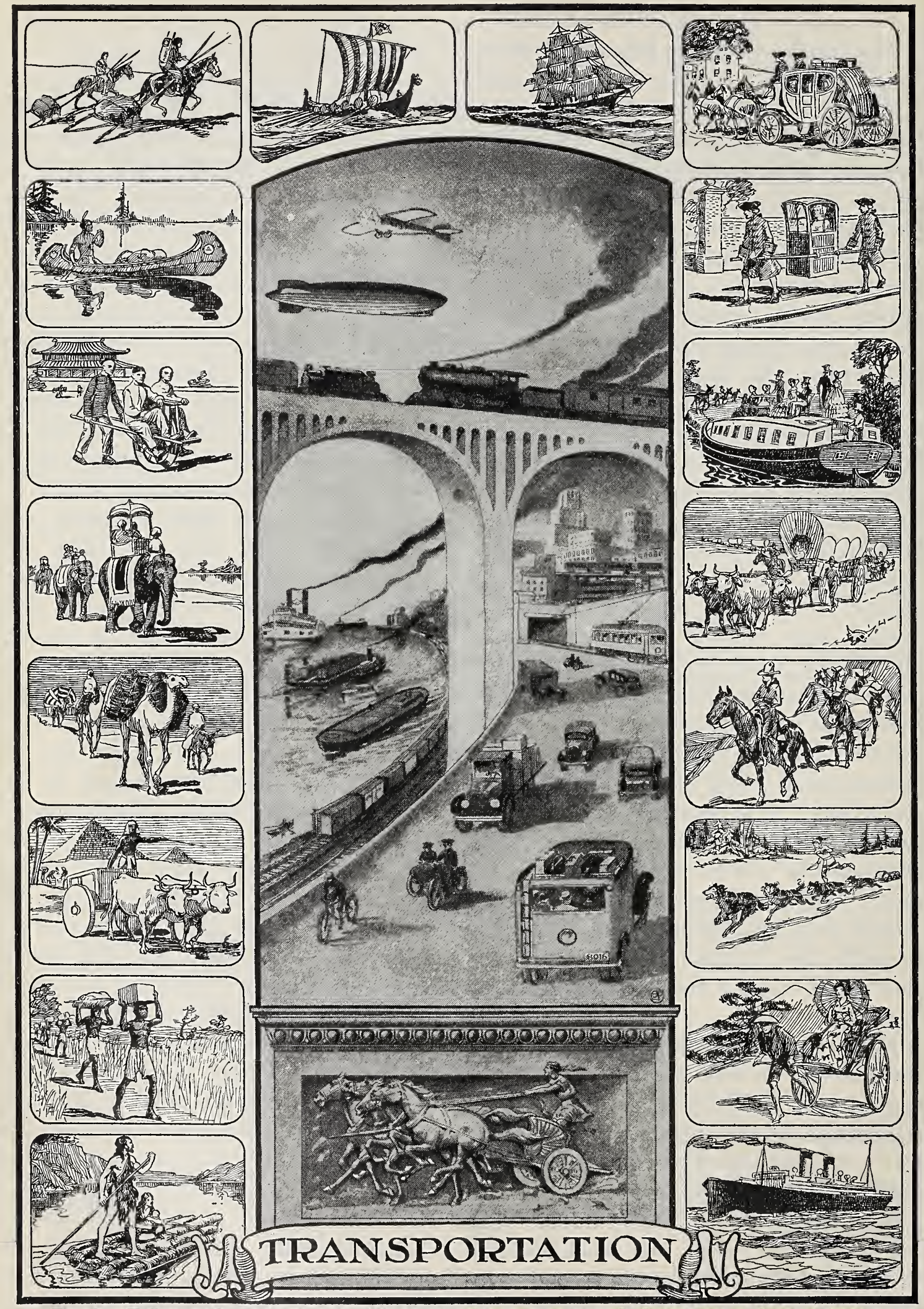

Fig. A. Tell something about each of the kinds of transportation which you see in these pictures.

of the rivers had become important when steamboats came into use.

After the Erie Canal was finished, freight came to New York City from the towns on the Great Lakes just as though they had been towns on the Hudson River. Look up in the Appendix for the populations of Boston, New York, Philadelphia, Baltimore in the early days; in the later days. What do these population figures tell you about the Erie Canal?

The success of the Erie Canal was so great that building canals became quite the style. For a number of years the canals were very important indeed to our country. They were almost as good as rivers where boats could go. But nearly all of these canals are now useless, and have gone to ruin because a third revolution has occurred.

Railroads— still another revolution. It was easier to build a railroad than to build a canal, because a canal must be so level that it will hold water from end to end, and so low down that water can flow into it. Railroads can go up grades and across deserts, and usually cost less than canals. Between 1830 and 1840 the people began to build railroads, and canal building soon stopped.

But before we tell how the railroads helped us to make homes, let us see what was happening in the southern and western parts of our country.

Appoint a committee of three. Each person must be prepared to give the facts about these subjects: *Early American Railroads, Early Steamboats, Early Canals.* Let each address the class (*citizens' conference*) in order to show the uses and profit that might be expected from his scheme. The *citizens' conference* must ask questions. The committee and citizens will need to use a large map. Let the speaker for canals be George Washington.

Writing questions. Write five questions for your classmates to answer about this story.

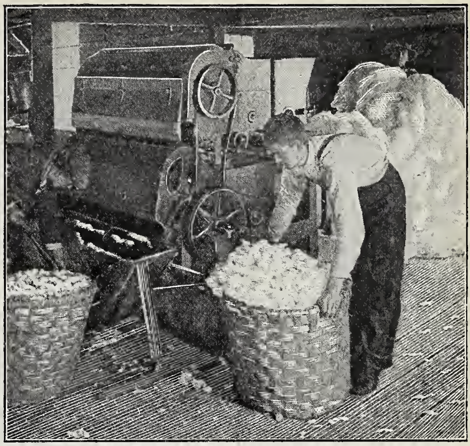

Fig. A. This cotton gin will pick seeds from cotton as fast as 200 men could do it. What is such a machine worth a day? The baskets contain unginned cotton.

HOW COTTON AND GOLD SENT SETTLERS TO NEW PLACES

The cotton gin. Machinery often makes revolutions in the affairs of men. The cotton gin was such a machine. Cotton is the fiber that grows on the seed of the cotton plant (Fig. 259-A). No one knows how long men and women had been taking the cotton in their hands and pulling the seeds with their fingers, one at a time, from the fiber. This was a slow job. By working all day long, a worker could get only about two pounds of cotton. This made cotton so costly that only a very little of it was then grown.

Eli Whitney went from Connecticut to teach school in South Carolina. He saw this slow work of picking seed from cotton by hand. He wanted to find a way of getting the work done faster. Young Whitney thought and thought about this and then made some experiments. In 1792 he made a machine called the *cotton gin,* and that caused a revolution in the Southern States. You can pour cotton into a cotton gin by the basketful, turn the wheels, and the seeds will run out in

Fig. A. Picking cotton by hand in the Southland.

one place, and the cotton in another place. The cotton gin does the work of hundreds of people.

Cotton made several new states. Cotton quickly became an important crop in the Southern States, where the long summer season suits cotton. Europe could grow no cotton. The Europeans wanted it very badly and were delighted to get the big bales of cheap cotton from Charleston, Savannah, and other ports of the South Atlantic coast. The cotton planters of these states were also delighted. They had a crop to sell for money, and for more than a hundred years cotton was the chief export of the United States.

About 1800, while the people of New England and the other North Atlantic Coast States were streaming westward in their wagons, the people of the South Atlantic States started west also. They went to make more cotton plantations. The Negroes who worked in the cotton fields in summer spent the winter days cutting down the forest and burning the trees to make new fields. In summer they cultivated cotton in these clearings. The Southern States have many rivers on which steamboats can carry freight to the sea. The boats carried the cotton to the Gulf and Atlantic coasts for shipment to Europe and to the New England States. What does the population table (Appendix) show you about the growth of the Southern States?

California gold. In 1848 a miner found gold in the sand in a creek in California. As soon as the good news spread, miners went to work with pick, shovel, and pan (Fig. 315-B) everywhere along this creek and

in many other creeks on the western slope of the Sierra Nevadas. Many miners got as much as ten dollars' worth of gold in a day, and sometimes even more. Anyone who wished could go out and get gold, because it was found in many streams. Most of the land on which gold was found belonged to the Government, but miners were allowed to stake claims.

The gold rush. At this time few people in the United States were getting more than a dollar a day as wages. The news of this free gold spread over the Eastern States with lightning speed. Millions of excited people wanted to go there, and many thousands actually did go. You can easily remember that the gold rush was in 1849, for these people are called *Forty-niners.* They went in every possible way. They went as fast as they could, because they wanted to get there before others got all the gold. Some got into sailing vessels at Boston and other Atlantic ports and sailed all the way around South America and Cape Horn to San Francisco Bay. Others took ship to the Isthmus of Panama, and walked or rode on mule back fifty miles through the hot forests of the Isthmus to the city of Panama, and took ship there for San Francisco. Thousands went overland in wagon trains and on horseback and even on foot, walking while wagons carried their baggage. Many of these wagon trains started from Kansas City, Leavenworth, and other places on the Missouri River. How does Figure 244-A tell you why Missouri River towns were a starting point for the wagons?

The western land and the overland journey. The Forty-niners who went in wagons had a hard journey. Few white people had ever crossed the wide, empty land they had to cross. It was a puzzle for them to know which route would be best. The Forty-niners had no good maps. The rainfall map will tell *you* something about the land near the Mississippi River. Look at it carefully. Figure 197-A is a picture of that kind of land. What do the rainfall map (Fig. 247-A) and Figure 200-A tell you about the land near the eastern base of the Rocky Mountains? The rainfall map and Figure 202-A will tell you about the land between the Rocky Mountains and the mountains near the Pacific coast (page 202).

The wagon trains of the gold seekers had to have water every day for the horses or oxen, and the animals had to live on what they could find by the way. Tell which of the three kinds of land was best for their kind of traveling.

The physical map (Fig. 184-A) shows a string of mountains across northern Nevada between the Rockies and the Sierras. You know that mountains have more rain than near-by lowlands. How do you suppose this long row of highlands may have helped the wagon trains to cross the dry land between the two great mountain systems? The Humboldt River in Nevada may help you to answer that question.

There is a valley in southeastern California with a very unpleasant name. It has no stream, and only a salty lake lies in the bottom of Death Valley (Fig. 306-A). Can you tell a story that might have actually happened to a wagon train traveling through this valley?

Gold made a new state. Many of the Forty-niners got lost and died in the deserts, but thousands reached California. In the history of our country, no state ever grew in population so rapidly as California grew for a few months after the discovery of gold. The white population in 1848 was 14,000. One year later it was 115,000. Twelve years later it was 374,000. Miners

Fig. A. Trace on this map the Oregon Trail as followed by Lewis and Clark. Give several reasons from the map why this was a difficult journey.

dug gold for years. First it was found in the sand and gravel of streams. Later men found it far back in the mountains, and dug deep mines there. Gold is still being taken from many of these deep mines, and many people still find a little gold in the stream beds.

Prepare a talk. Prepare a talk that Eli Whitney might have given to tell people about his new machine.

Make your own talk. Tell how and why the cotton gin sent settlers to new places. Where did they go?

Routes to California. Show on the map (Fig. 184–185-A) each of the land routes by which the Forty-niners went from New York to San Francisco, and something about the things they saw.

A map for your notebook. On a blank map of North America, shade in red the land explored and settled by the French. Shade in blue the land occupied by the English: (*a*) along the Atlantic coast from New England to Florida; (*b*) as far west as the Appalachian Mountains. Use black to trace: (*a*) French trips up the St. Lawrence, through the Great Lakes to Lake Michigan, down the Mississippi River to New Orleans; (*b*) Washington's trip from the mouth of the James River across the Appalachian Mountains to Pittsburgh, then to Venango.

Beheaded sentences. Find reasons for the following. Copy and complete the sentences.

1. Long ago people did not grow much cotton because ....

2. After the invention of the cotton gin, people raised more cotton because ....

3. In the Southern States it is easy to ship cotton to the coast because ....

4. The climate of the Southern States suits cotton because ....

5. The cotton gin gave more people work because ....

6. It was easier to travel westward from South Carolina than from Virginia because ....

7. California grew very rapidly in population after 1848 because ....

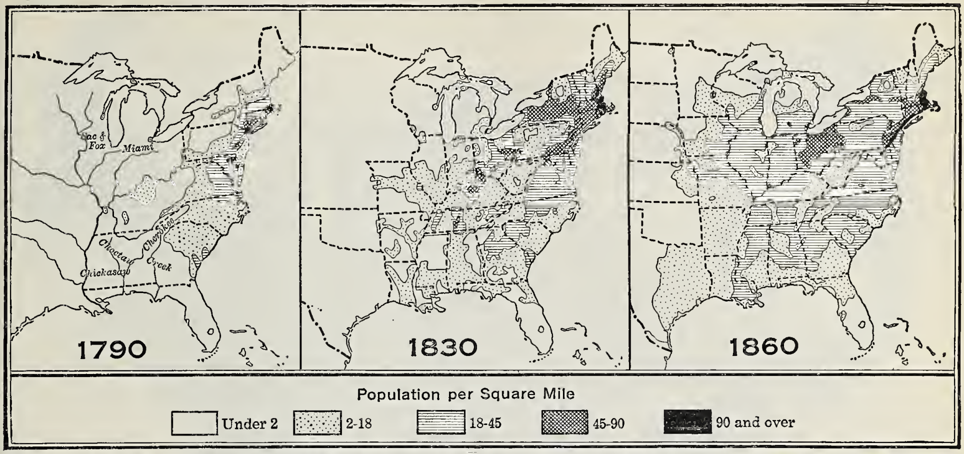

Fig. A. The first census (1790) gave the population of our country as 3,929,881. Where did most of the people live? By 1830 our population was 12,866,020. Notice how the population has moved westward. By 1860 our population was 31,443,321.

THE RAILROAD LETS MAN LIVE FAR FROM COASTS AND RIVER BANKS

The iron horse. The railroad was the greatest aid the settlers ever had. Before the railroad came, nearly all of the white people of North America lived within thirty or forty miles of some stream on which a boat could float their grain or meat to market.

The railroad made man free to go far from the river bank. The iron horse traveled so rapidly and so cheaply that the settler could take lumber, plows, and machinery, and even horses and go far out on the plains beyond the Mississippi. There he could make a farm and send his crop back by train or to the river steamer.

Nature had made it very easy for the settler to make his home quickly in much of the Interior Plains — *after he had a railroad near him.* From Illinois westward, most of the land had no forest except some growth of trees along the streams. Because the settler did not have to clear his land of trees as settlers in other places had to do, these settlers could have fields and crops the first year.

After the railroads were built, this treeless country was settled by farmers much more rapidly than any other piece of land in the world was ever settled. Bread and meat became very cheap in the eastern cities. What do the Appendix tables tell you about the dates of rapid settlement in Iowa? in Kansas? in Nebraska? in Dakota? in Montana? in Colorado? What do they tell you about the speed of settlement by wagon before 1820? by steamboat before 1850? by train?

The railroad crosses the continent. The East and the Mississippi Valley were now settled. California had grown fast, and its two smaller neighbors, Oregon and Washington, were also being settled rapidly. These Pacific coast settlements, however, were far, far away from the states of the Mississippi Valley with much of the land between still unsettled.

The easiest way to reach California from the Mississippi Valley or from the states along the Atlantic was to go by ship to

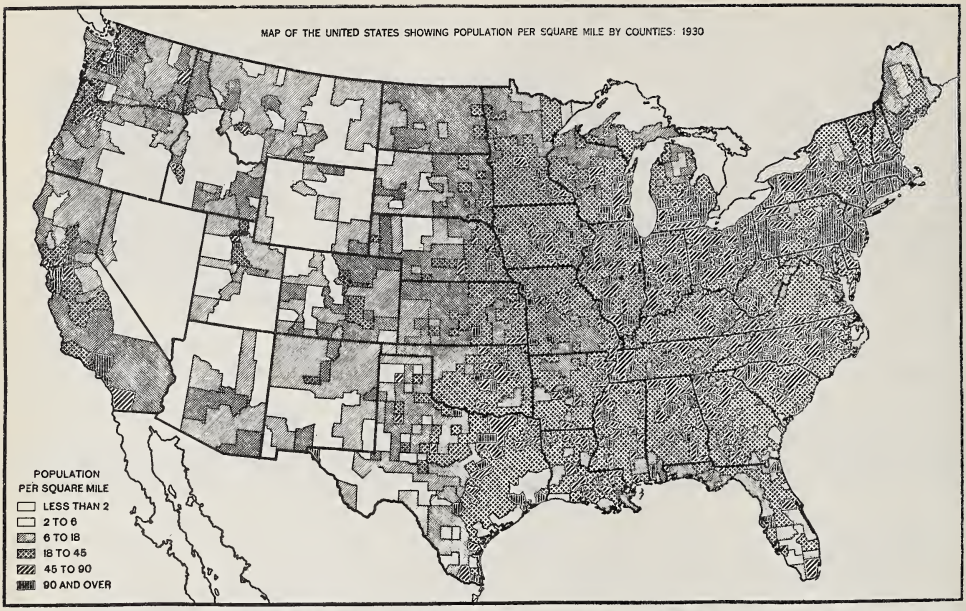

Fig. A. In 1930 our population was over 122,000,000. You notice from this map that our people have not scattered themselves evenly over our country. Some parts have very many people; some parts have very few. How many people to the square mile has the neighborhood in which you live?

Fig. B. The *Pony Express.* Sometimes unfriendly Indians made the trips of the express riders very unsafe.

Colon, cross the Isthmus of Panama by train, and take another ship to San Francisco. There was also some travel by the overland route, and passengers and mail could be carried from Missouri River points to California in about twenty-five days. In 1860 the Pony Express began a faster mail service from St. Joseph, Missouri, to San Francisco, a distance of 1,050 miles. Picked riders on fleet horses, by riding in relays, could make the trip in eight days. The postage cost $5.00 a half ounce.

The Pony Express service ended eighteen months later, shortly after a telegraph line across the country was completed in 1861.

The next great event in settling America and uniting the states was building a railroad across the continent. The first transcontinental (*trans* means "across") railroad was begun in 1863 and finished in 1869. It ran from Omaha, Nebraska, to Sacramento, California, and was built with the help of the United States Government. The "iron horse" had finally joined the East, the Interior Plains, and the West into one great nation.

Transportation. Tell a story about each of the following:

1. The settler goes to the new neighborhood on the American frontier, (*a*) in 1800; (*b*) in 1830; (*c*) in 1860.

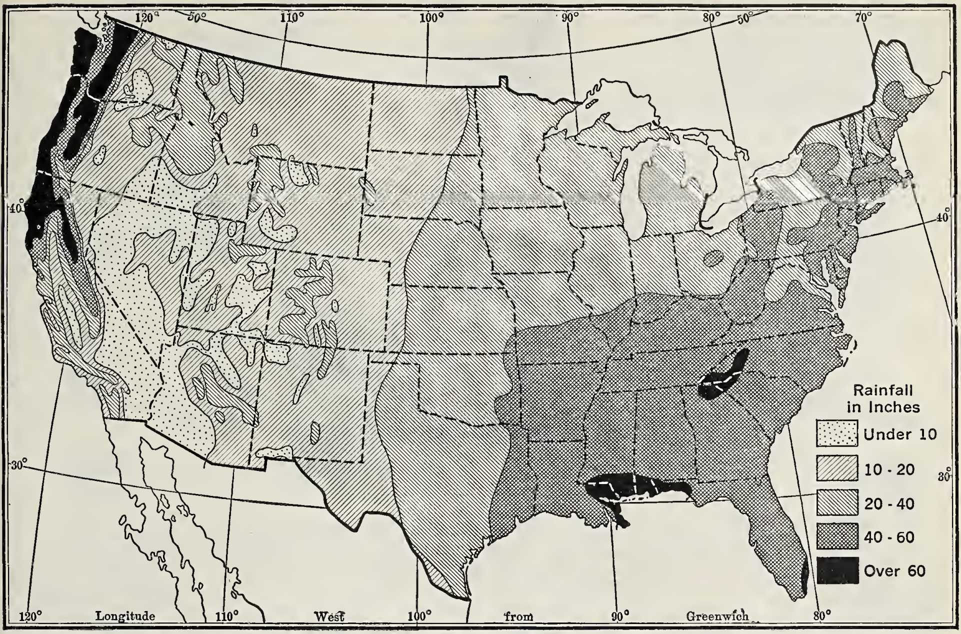

Fig. A. This map shows how much rain falls each year in different parts of the United States. If a place has twenty inches of rain, enough rain fell during the year at that place to cover the ground to a depth of twenty inches. What can you say about the population (Fig. 246-A) where the rainfall is less than twenty inches?

Making a museum. Have you ever visited a museum? What is in one? What do museum objects tell about the days that are gone? Would you like to make a United States museum for your room? Here are some of the things you might make:

1. A log cabin with a chimney of clay and sticks; barn; fields with rail fences of match sticks or small sticks split from thin board; wagon; wooden plow; animals of paper or clay; clothespin people or people made of wire and cotton; grass seed planted in sand or fine earth and watered every day makes a fine field.
2. A flatboat.
3. A covered wagon.
4. A gold-miner's tools.
5. Hand weaving. An old picture frame with nails hammered in two sides makes a good loom. Stretch strong cord between the nails and sew together narrow strips of rag to weave over and under the cord.

A guessing game. It would be fun to act some of the interesting scenes in this chapter. Make a list of those that might be acted. If you act the scenes in pantomime, the rest of the class might guess what scene you are acting. Keep a score and see which group in your class guesses most scenes.

Making motion pictures. Use the open side of an empty box for the front of the stage. Place two pieces of broom handle in box, allowing them to extend through two holes bored in the top of the box at each end and near the front. Tack a long strip of paper, perhaps twelve inches wide and ten feet long, to these rollers. Draw pictures, print titles and paste them on this strip. By turning the rollers extending above the box, the pictures may be reeled across the stage. A curtain may be fastened on the front of the box.

Here are a few of the things you might show:

1. Columbus discovers America.
2. The French (Spanish or English) in America.
3. First homes in America.
4. Washington's mission to the French government.
5. The Lewis and Clark expedition.
6. Uses of rivers.

What other things might you show?

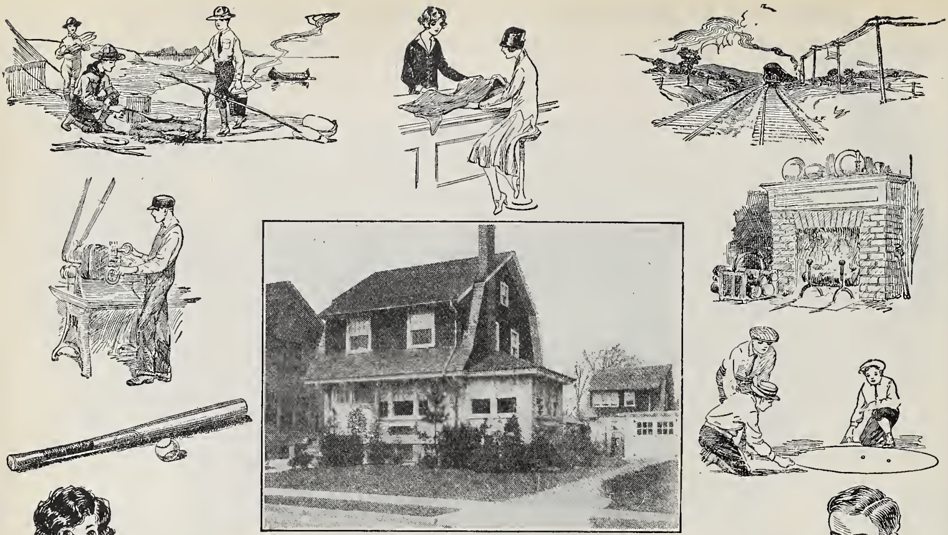

Fig. A. The six needs of all mankind are illustrated very well indeed in these pictures. Name each kind of need. Probably no country in the world supplies these needs so abundantly as does our own good land.

THE UNITED STATES

INTRODUCTION

> See if this short chapter helps you to answer this question: Why is the United States the richest country in the world?

Our good land. In our journeys across North America last year, we found many different kinds of land. In what part of our airplane journey were we not in the United States? We found also that the United States is a very large country. It is also a very good country in which to live and to make a living. The people of the United States are fortunate. The climate is good, so that most of the people are strong and healthy and want to do things. The children in American schools play hard. In some countries it is so hot that children do not want to play active games. In other countries it is so cold that people sit by the fire nearly all winter. In some countries the people are not so healthy as they are in the United States, and when people are sick they are not happy and they do not feel like doing things.

Besides having a good climate, our country is rich in the materials needed for food, clothes, shelter, fire, machines, the power that runs machines, and for making things that please us because they are beautiful or interesting.

The people of the United States. For more than two hundred years people from other countries have wanted to come here to live because good wages can be paid in a country so rich in the things which men need. Thousands have come from nearly all the countries of Europe to live in the United States. Many Canadians have come to the northern part of our country. In the Southwest are many Mexicans, dark-haired like their Spanish

or Indian ancestors. Near the Pacific coast we find some black-haired people from China and Japan. In the South are Negroes whose forefathers were brought from Africa. No other great nation is made up of people from so many countries.

We have more than one hundred twenty millions of people, but there is enough land for all. There is much land in the United States that we do not yet need to use for crops. We feed ourselves and have much food to spare. This surplus we can send to the people in other countries if they can send goods to pay for it.

The growth of the United States. We have also seen how our country has grown by getting one piece of land after another. Today the United States is one of the largest countries of the world. In addition to our forty-eight states, we own Alaska and many islands, some of which are in the West Indies, some in the south Pacific Ocean, some in the western Pacific, and some in the eastern Pacific. Find the Philippine Islands and the Hawaiian Islands on the world political map.

Each section of the country helps all the rest. When the white men first came to America they worked chiefly at farming, and each family and each neighborhood supplied nearly all of its own needs. Since we have had railroads and steamboats and trucks, things can be sent from one part of the country to many other parts of the country. That makes many states of use to each one of us because different places produce different things.

How shall we study the forty-eight states in our country? To study them one state at a time would be too many; so we study them in groups and give each group a special name. Name the groups of states (Fig. 249-A).

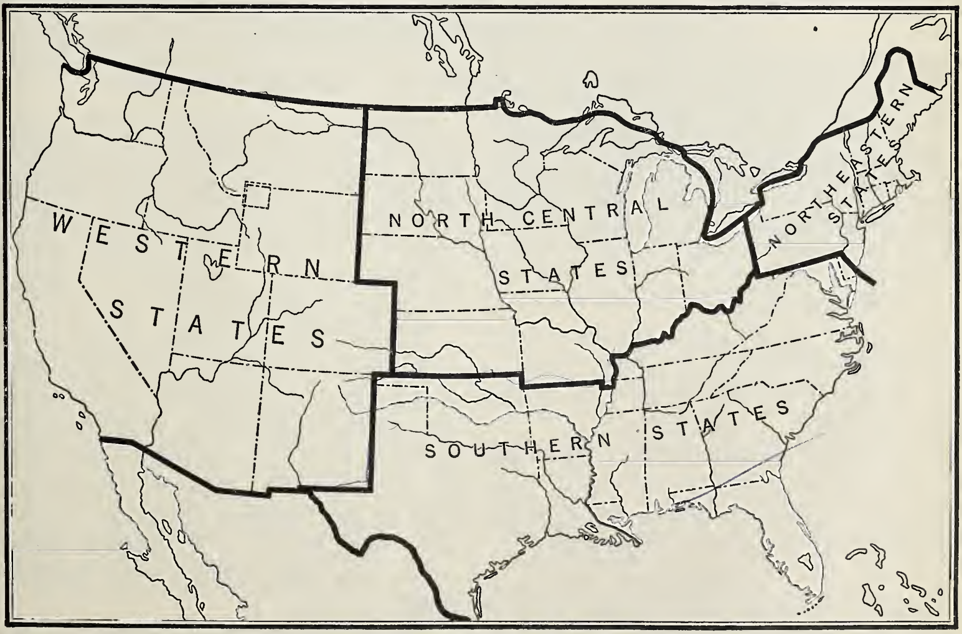

Fig. A. This map shows our country divided into four groups of states. We shall study the groups in the following order: Southern, Western, North Central, and Northeastern.

HU-1

Fig. A. The young man at the left has learned how to reach for his grapefruit in the warm, sunny lands of the Rio Grande Valley. His sister at the right has bunches of grapes almost as big as she. Their grandfather has twenty acres of land planted with narcissus. These pictures show what warm weather and plenty of water do for crops in southern Texas.

THE SOUTHERN STATES

A LAND WITH MANY KINDS OF NATURAL RICHES

MANY KINDS OF CLIMATE

When you have read this chapter, be ready to answer this question: Are the people right who think that the Southern Farming Region has a great future?

Differences in Texas. In the month of March two men who had left their homes three days before met in Dallas, Texas.

"What kind of weather were you having in Brownsville?" (Fig. 254-A.)

"It was warm and sunny. I had fresh corn from my garden the day I left. How was the weather behaving at Amarillo (northern Texas) when you left home?"

"Cold, and the ground was frozen."

The story shows that a day in March may be warm in one place and cold in another place, even in the same state.

Weather in the Southeast. The eastern part of the Southern States also has many different kinds of weather. The man from Amarillo might have found snow and frozen ground in western North Carolina, western Virginia, eastern Tennessee, or eastern Kentucky early in March.

Weather makes a tourist industry. In your trip to Florida you saw that some people in the Southland make money because the weather in the Southern States is warm when it is cold in the Northern States. You saw the snow and felt the cold in the Northern States, and in the same week found it very pleasant indeed to be out of doors in half a dozen Southern States.

Florida and the lower South. Florida has a warmer winter than any other state

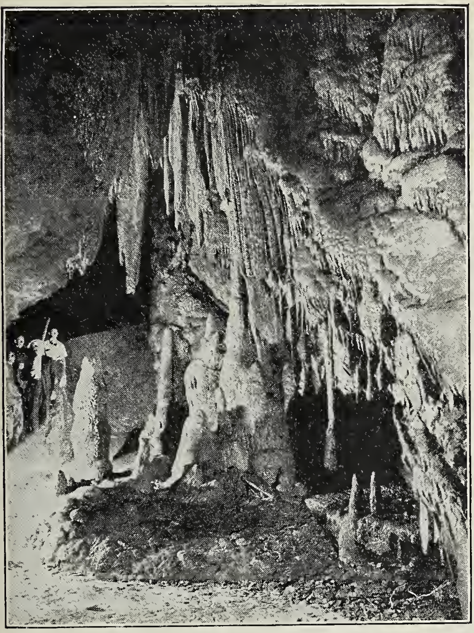

Fig. A. Running water dissolved limestone rock underground and made this large cave in the Great Valley of Virginia. Here are two hard words for you to look up in your dictionary: *stalactites*, *stalagmites*. Find each form in the picture.

Fig. B. Palm trees and other tropical plants growing in Florida. See the pond of water. It is a limestone sink (Fig. C).

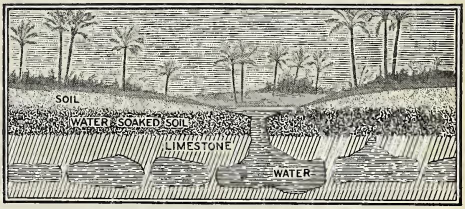

Fig. C. Running water dissolves the limestone rock underground, the surface soil caves in, and a limestone sink is formed.

except a bit of Texas, because Florida extends so far south and because a great stream of water, called the *Gulf Stream*, carries warm water around three sides of the long peninsula.

It is not surprising that Florida is the state having by far the largest southern tourist business; but all of the southern part of the South is becoming more important as a winter resort. People play golf almost every day in December, January, and February at San Antonio or Austin, Texas; Augusta, Georgia; or Pinehurst, North Carolina, and at a hundred other places throughout the lower South.

In the early winter, thousands of automobiles may be seen headed toward Florida, Texas, or some other choice spot in the warm Southland. They are from New York, New Jersey, Maine, Minnesota, Kansas, and every other northern state. Some carry tents and bedding; others carry only the baggage necessary for those who sleep in hotels. Many of the motorists stop on the way to walk a mile or two underground in the beautiful and interesting caverns of Virginia or in the Mammoth Cave in Kentucky.

The gardens of Charleston. In spring, visitors from other parts of our country and also from Europe go to Charleston,

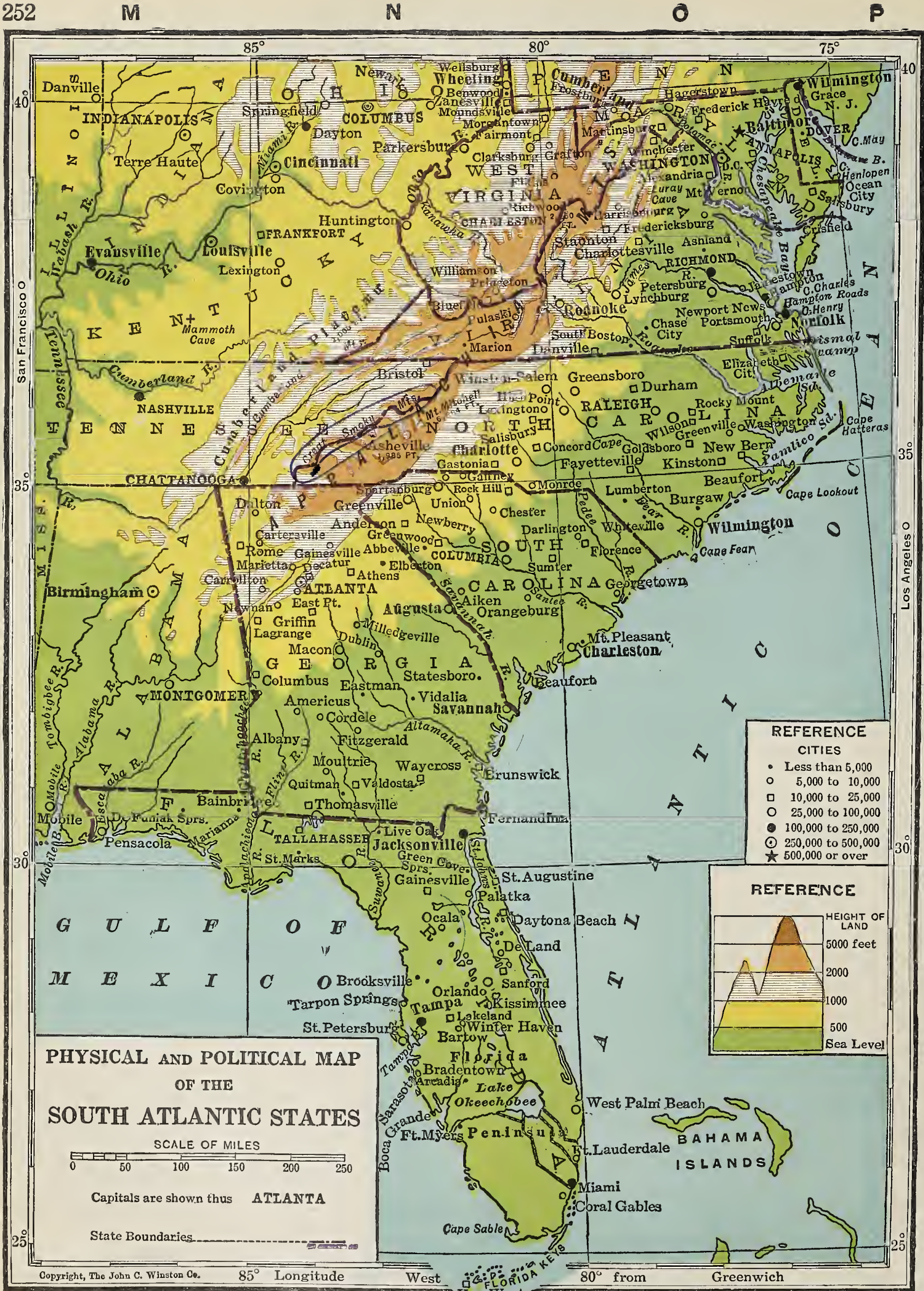
M
N
O
P
PHYSICAL AND POLITICAL MAP
OF THE
SOUTH ATLANTIC STATES
SCALE OF MILES
0 50 100 150 200 250
Capitals are shown thus ATLANTA
State Boundaries
REFERENCE
CITIES
Less than 5,000
5,000 to 10,000
10,000 to 25,000
25,000 to 100,000
100,000 to 250,000
250,000 to 500,000
500,000 or over
REFERENCE
HEIGHT OF LAND
5000 feet
2000
1000
500
Sea Level
Copyright, The John C. Winston Co.
85° Longitude West 80° from Greenwich
San Francisco
Los Angeles
GULF OF MEXICO
ATLANTIC OCEAN
BAHAMA ISLANDS
FLORIDA KEYS
Key West
KENTUCKY
TENNESSEE
WEST VIRGINIA
VIRGINIA
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
ALABAMA
Florida
INDIANAPOLIS
COLUMBUS
FRANKFORT
NASHVILLE
CHARLESTON
RICHMOND
WASHINGTON
ANNAPOLIS
DOVER
RALEIGH
COLUMBIA
ATLANTA
MONTGOMERY
TALLAHASSEE
Cincinnati
Louisville
Evansville
Chattanooga
Birmingham
Charlotte
Asheville
Norfolk
Baltimore
Wilmington
Charleston
Savannah
Augusta
Macon
Columbus
Jacksonville
Tampa
St. Petersburg
Orlando
Miami
Coral Gables
Pensacola
Mobile
Cape Hatteras
Cape Lookout
Cape Fear
Cape Sable
Lake Okeechobee
Mammoth Cave
Mt. Mitchell 6,711 FT.
Great Smoky Mts.
Cumberland Plateau
Chesapeake Bay

Fig. A

HU-1

Fig. A. The Mardi gras at New Orleans. Rex, in his royal robes, is about to be greeted by the mayor of the city. How is Rex traveling?

South Carolina, to see famous gardens of azaleas and magnolias planted by the colonists more than two hundred years ago. Charleston is usually crowded with visitors in azalea time.

Mardi gras at New Orleans. Late in February, while cold and snow hold the North, New Orleans has a great outdoor festival called *Mardi gras*. This is a street carnival of fun and flowers. Thousands of people parade to the music of dozens of bands. The procession is led by *Rex*, the king of the festival. Rex is attended by knights and ladies dressed in fancy costumes. Fifty thousand, or even a hundred thousand, visiting school children go to New Orleans to see the festival. Travelers fill the hotels to overflowing, and some guests must stay in the homes of the citizens.

The night of Mardi gras, many balls are given in New Orleans, but the dancing stops when the cathedral bell rings at midnight. Lent has begun. Mardi gras is over.

Cool summer in the southern highlands. Many people whose homes are in the warm lowlands of the South go to the mountains — the Southern Appalachians — during the summer to enjoy the bracing climate.

Reading from the maps. 1. Make a short talk to the class about what you learn from Figure 251-C.

2. Does Figure 254-A help you to explain why one part of the Southern States is treeless and almost a desert; why other parts have large swamps; why the Southern Appalachian Mountains are covered with thick forests? Point out these things on the wall map.

3. What is the elevation of the highest point in the Southern States east of the Mississippi River? (Fig. 252-A.)

In making these map studies, keep in mind three important facts of geography:

a. Latitude affects climate.

b. Mountains affect climate.

c. Rainfall differs from place to place.

Think often of these things as you study the Southern States.

A map for your notebook. Make a rainfall map of the Southern States, using three colors.

Choice to make. Choose a place in the Southern States (Fig. 252-A) for your summer vacation; for your winter vacation. Tell about March weather in the Southern States.

Extra credit work. Find out more about the Gulf Stream from a reference book.

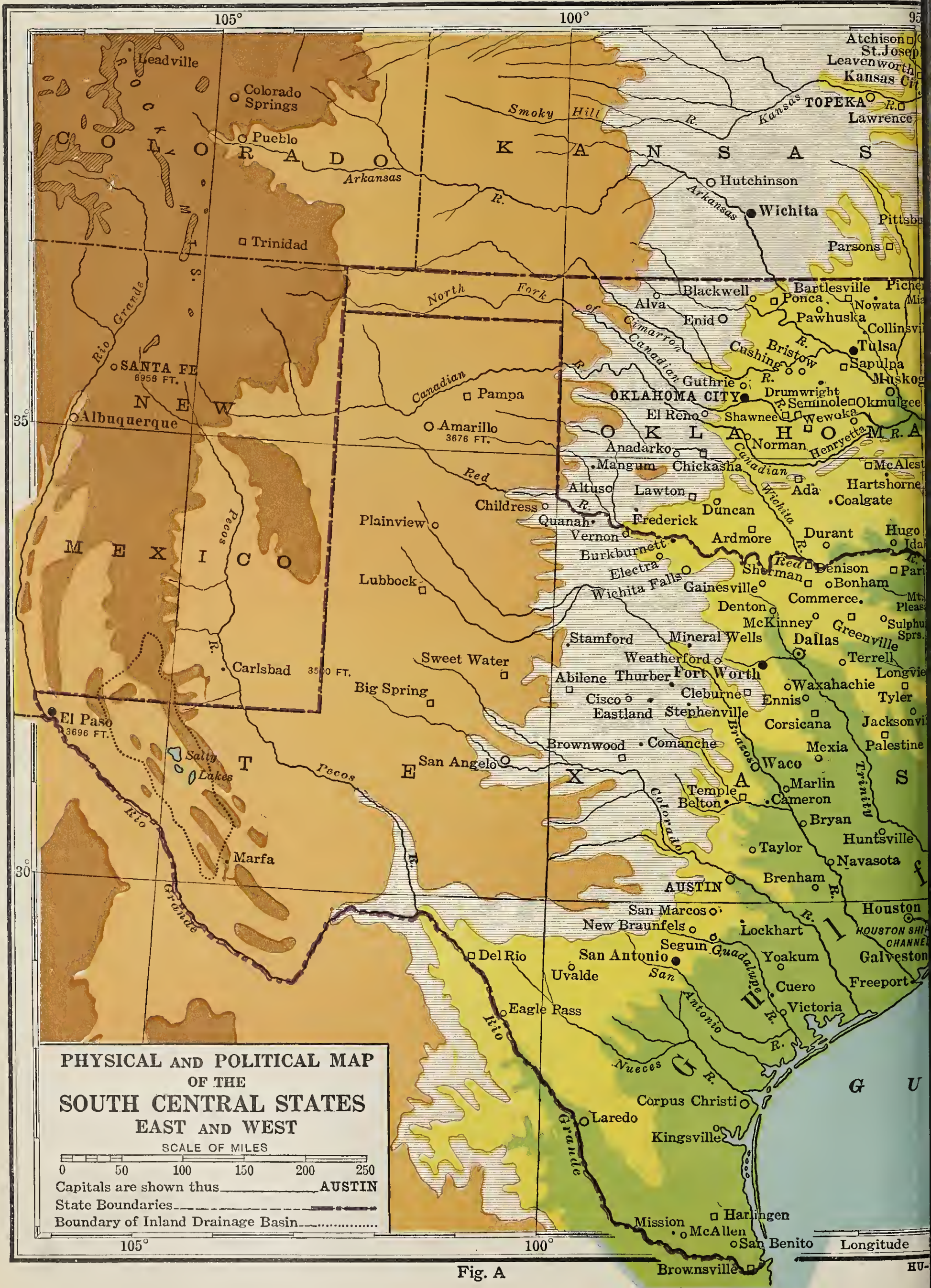
M
N
O
1
2
3
105°
100°
PHYSICAL AND POLITICAL MAP
OF THE
SOUTH CENTRAL STATES
EAST AND WEST
SCALE OF MILES
0
50
100
150
200
250
Capitals are shown thus AUSTIN
State Boundaries
Boundary of Inland Drainage Basin
Longitude
35°
30°
C O L O R A D O
K A N S A S
N E W M E X I C O
O K L A H O M A
T E X A S
G U L F
R O C K Y M T S.
Leadville
Colorado Springs
Pueblo
Trinidad
Smoky Hill R.
Arkansas R.
Atchison
St.Joseph
Leavenworth
Kansas City
TOPEKA
Lawrence
Kansas R.
Hutchinson
Wichita
Pittsburg
Parsons
North Fork of Red R.
Rio Grande
SANTA FE
6959 FT.
Albuquerque
Canadian
Pampa
Amarillo
3676 FT.
Red
Pecos R.
Plainview
Childress
Quanah
Lubbock
Carlsbad
3500 FT.
Sweet Water
Big Spring
El Paso
3696 FT.
Salt Lakes
Marfa
Pecos R.
San Angelo
Del Rio
Uvalde
Eagle Pass
Rio Grande
Laredo
Nueces R.
Blackwell
Alva
Enid
Cimarron R.
Canadian R.
Guthrie
OKLAHOMA CITY
El Reno
Shawnee
Anadarko
Mangum
Chickasha
Altus
Lawton
Duncan
Frederick
Vernon
Burkburnett
Electra
Wichita Falls
Ardmore
Bartlesville
Ponca
Nowata
Pawhuska
Collinsville
Tulsa
Sapulpa
Cushing
Bristow
Drumwright
Seminole
Okmulgee
Muskogee
Wewoka
Henryetta
Norman
McAlester
Hartshorne
Ada
Coalgate
Durant
Hugo
Sherman
Denison
Bonham
Paris
Gainesville
Denton
Commerce
McKinney
Greenville
Sulphur Sprs.
Dallas
Terrell
Stamford
Mineral Wells
Weatherford
Fort Worth
Abilene
Thurber
Cleburne
Waxahachie
Ennis
Longview
Tyler
Cisco
Eastland
Stephenville
Corsicana
Jacksonville
Palestine
Brownwood
Comanche
Mexia
Waco
Brazos R.
Colorado R.
Trinity R.
Temple
Belton
Marlin
Cameron
Bryan
Huntsville
Taylor
Navasota
AUSTIN
Brenham
San Marcos
New Braunfels
Lockhart
Seguin
Guadalupe R.
San Antonio
San Antonio R.
Yoakum
Houston
HOUSTON SHIP CHANNEL
Galveston
Freeport
Cuero
Victoria
Corpus Christi
Kingsville
Harlingen
Mission
McAllen
San Benito
Brownsville

Fig. A


90°
85°
30°
35°
INDIANA
ILLINOIS
OHIO
MISSOURI
Ozark Plateau and Mountains
KENTUCKY
TENNESSEE
ARKANSAS
MISSISSIPPI
ALABAMA
GEORGIA
LOUISIANA
FLORIDA
WEST VIRGINIA
VIRGINIA
NORTH CAROLINA
SOUTH CAROLINA
Cumberland Plateau
CUMBERLAND MTS.
GREAT SMOKY MTS.
Mt. Mitchell 6,711 FT.
Mississippi R.
Ohio R.
Missouri R.
Wabash R.
Tennessee R.
Cumberland R.
Arkansas R.
Ouachita R.
Red R.
Sabine R.
Yazoo R.
Pearl R.
Tombigbee R.
Alabama R.
Chattahoochee R.
Flint R.
Savannah R.
Mobile Bay
Mouths of the Mississippi
GULF OF MEXICO
Cincinnati
Louisville
St. Louis
455 FT.
Kansas City
Jefferson City
Sedalia
Springfield
Evansville
Nashville
Memphis
273 FT.
Cairo
322 FT.
Chattanooga
Knoxville
Asheville
1985 FT.
Lexington
Frankfort
Little Rock
Birmingham
Montgomery
Atlanta
Jackson
Vicksburg
Meridian
329 FT.
Mobile
Pensacola
Baton Rouge
New Orleans
Shreveport
Lake Charles
22 FT.
Tallahassee
Macon
Columbus
Athens
Rome
Huntsville
Copyright, The John C. Winston Co.
REFERENCE
CITIES
• Less than 5,000
○ 5,000 to 10,000
□ 10,000 to 25,000
○ 25,000 to 100,000
● 100,000 to 250,000
⊙ 250,000 to 500,000
★ 500,000 or over
REFERENCE
HEIGHT OF LAND
10000 feet
5000
2000
1000
500
Sea Level
West from Greenwich

1

2

3

Fig. A

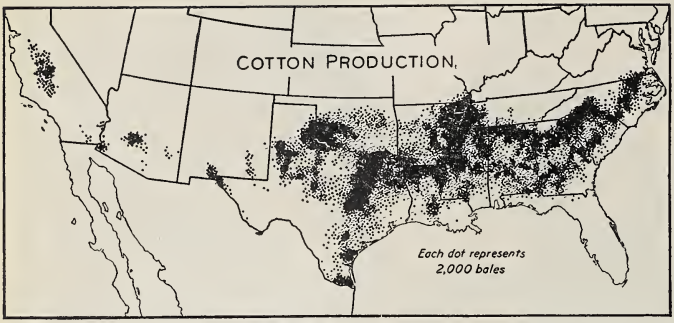

Fig. A. Of course you will look carefully at this map to see where cotton is raised in the United States.

Fig. B. This well-bred cotton plant is as tall as some of the pupils in your class, and would reach the shoulders of the tallest pupils.

COTTON, THE GREAT MONEY CROP

Climate and cotton. Climate helps the Southern States to have a great cotton industry. The cotton plant is a native of the warm parts of the world, and it must have a growing season of at least two hundred warm days. How many days are between spring frosts and autumn frosts where you live?

Planting cotton. During the winter or in the early spring, the cotton farmer, with his tractor or team and plow, goes out to prepare his fields for planting. You can find thousands of them anywhere between Norfolk, Virginia, and Birmingham, Alabama, and from Birmingham westward to western Texas.

After the farmer has made the soil ready for planting, he waits for the sun to warm the earth so that the cottonseeds will sprout quickly. When the earth is warm and it is time to plant cotton, the farmer takes his tractor or team and cotton planter and plants the cotton seed in "beds," or rows, prepared for this purpose. These "beds" are three or four feet apart and extend across the field.

Cultivating cotton. The farmer now hopes for a few warm showers and some bright, sunny days. Cool, rainy weather may cause the seeds to rot. Soon long rows of little cotton plants peep through the soil, and weeds and grass come with them. To kill the weeds and grass, the farmer, with a tractor or team to pull his cultivator, goes back and forth across the field, plowing under all the weeds and grass between the rows of cotton. The cultivator cannot kill the weeds and grass that are between the cotton plants in the row. This must be done with a hoe, or even with the fingers. Up and down the rows of cotton go the farmer, his boys, perhaps his wife and older daughters, hoeing and chopping out weeds. They chop out some of the plants because each plant must stand alone in the row at a distance

Fig. A. The length of the growing season in the United States. For how many days will plants grow out of doors in the neighborhood in which you live? How many months is this?

of one to two feet from the next plant. Often the workers sing as they work. Perhaps they sing "Way Down upon the Suwannee River" or "Nobody Knows the Trouble I've Seen."

The battle with the weeds. All summer long this battle with the weeds must be kept up because the warm weather, the damp air, and the frequent rains make weeds grow as fast as cotton plants, or even faster. If the weeds are allowed to grow, the cotton plants will have their food taken away from them and be smothered.

In the summer a cotton field is beautiful indeed. Large, pinkish white blossoms appear on the dark green plants. Still the plows and hoes are busy keeping out the weeds. The blossoms fall, and in their place is a round little pod called a boll (pronounced *bowl*). This is the fruit of the cotton plant. At the end of summer, or the beginning of autumn, the bolls begin to burst open, showing the white cotton (*lint*). It is time to begin picking the cotton. The farmer now wants bright, sunny days; because a heavy rain may knock the cotton out of the bolls and beat it into the earth, and thus spoil some of the crop.

Picking cotton. Picking time is the busiest season of all. One man can plant and cultivate twice as much cotton as he can pick. So, at picking time, everyone goes to work — men, women, old folks, and children. Up and down the rows they go, picking the little bunches of white cotton (Fig. 256-B) and stuffing them into long bags or baskets. Sometimes the fields must be picked over more than once because the cotton plant keeps right on blooming, even when some of the cotton is ripe. Through September, October, and November, and sometimes until after Christmas, picking cotton continues. Some cotton is

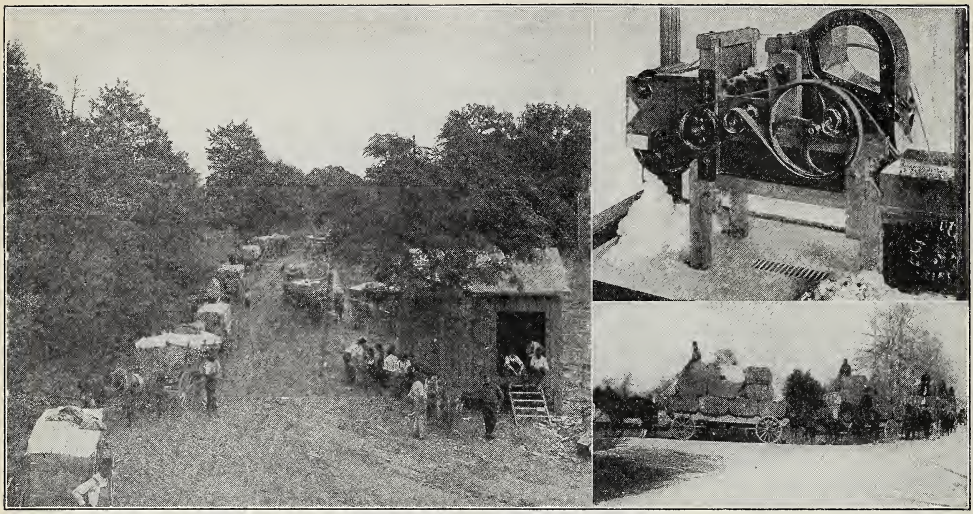

Fig. A. Find in these pictures the following: the tenant farmers wait their turn to have their cotton ginned; the cotton gin; hauling cotton bales to market over hard-surfaced roads. How many bales are there to a load?

picked by machinery, but most of it is still gathered by human fingers.

The vacation season. After the crop has been picked, the farmer has a time of rest until he must again plow for the next cotton crop. Perhaps he hunts rabbits, for there are millions of them in the bushy woods and fields of the Cotton Belt, and fried rabbit is good food. Hunting opossums and raccoons is another great sport and also a source of food. A dog that can smell the trail of one of these animals and follow it to the tree where it has taken refuge and then call his master is highly prized in the Southland.

The gin, the press, and the bale. The white, fluffy cotton that rolls out of the cotton picker's bag is taken by wagon and truck to the gin. You know about this machine (page 258-A) which tears the long white fibers from the little black seeds. From the gin the cotton goes to a press, which squeezes a great pile of loose, light lint into a small, tight, heavy bale (Fig. 258-A) that is easy to handle and does not take up much room in wagons, cars, and ships. The cotton grower may put the result of a whole year's work of himself and his family into the truck or wagon that takes his bales of cotton to market.

When the bales leave the press, the cotton is ready to go by train or boat to a cotton factory somewhere in the United States, or to a port for shipment to a foreign country. Many ships are loaded with cotton for foreign countries, at Houston and Galveston, Texas; New Orleans, Louisiana; Mobile, Alabama; Savannah, Georgia; Charleston, South Carolina; and Norfolk, Virginia. Railroad trains and trucks carry millions of bales to American cotton factories.

The one-crop plantation system. In Arkansas, Louisiana, Mississippi, and the eastern part of the Cotton Belt are many large farms called *plantations*. Some plantations have more than a thousand acres of land. The owner usually rents the land to tenants, who plant, cultivate, and harvest the crop. A large plantation may be

Fig. A. Find in these pictures each of the following: cotton boll open and closed; boll weevil; cotton fibers sticking to cottonseed; cotton boll destroyed by boll weevil; the cattle tick which carries Texas fever to cattle; the mosquito which carries malaria.

under the care of ten, or even twenty tenants. The plantation owner usually furnishes the tenant with a mule, some plows, a house in which to live, and some ground for a garden. The tenant often buys the things which his family needs for a year from a storekeeper or cotton merchant to whom he must take his cotton in the autumn to pay for what he has bought. The tenant works about twenty-five acres, which is all that he and his family can take care of with the aid of one mule or horse. These farms are often called *one-horse farms* or *one-mule farms*. At the end of the year the owner of the plantation gets half of the cotton and the tenant gets the other half. If the price of cotton is high, they can buy things. If the price is low, they cannot buy very much, and they say that times are hard. Perhaps you can find the value this year of a 500-pound bale of cotton by getting the price per pound from a newspaper.

The small-farm system. In the western part of the Cotton Belt, in Texas and Oklahoma, most of the cotton farms are smaller and the cotton farmer grows corn also, and often keeps some cattle, hogs, and chickens. Thus he has several things to sell instead of only cotton; but cotton gives three fourths of the crop money that the farmers of Texas get.

Cotton exports. Cotton has been the greatest single export of the United States for most of the time since Eli Whitney invented the cotton gin. Cotton is a splendid crop to sell. Even a hard rain does not hurt a bale of cotton very much. It does not get moldy. Nothing will eat the lint after the seeds are removed. It is wanted by the people of many countries for making clothing. It is not surprising that, for more than a hundred years, tens of thousands of farmers in the Southern States grew nothing but cotton. The South was a kind of farmer's paradise, but you will now learn what happened when a bug entered this paradise.

The cotton-boll weevil arrives. One day in 1892 some Texas cotton farmers, down near the Rio Grande, found at picking time that many of their cotton bolls did

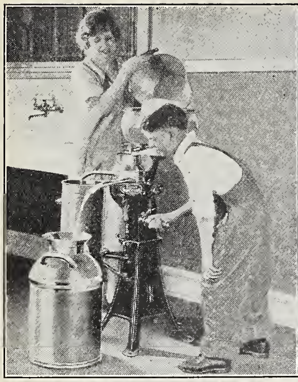

Fig. A. This farm-club boy has a cow. In this picture he is turning a separator which separates cream from the milk.

Fig. B. His sister is a member of a girls' canning club. The girls are picking beans which they will can under the direction of their county farm agent.

not open. The bolls were shriveled and dead because a worm had eaten tunnels through the unripe cotton. This was the work of Mexican cotton-boll weevils. The next spring the weevils had gone twenty-five miles to the eastward. They kept right on traveling twenty-five to fifty miles a year. Across the Cotton Belt they marched, destroying as they went. The cotton growers lost hundreds of millions of dollars' worth of cotton. A few people actually starved to death the year the weevil arrived, because they had nothing to sell and no money with which to buy.

When the cotton growers found that they could not control the weevil and that the destructive little worms had come to stay, they tried to get around this terrible trouble as best they could.

The weevil does not like dry weather. Therefore the farmers who lived in the drier part of central and even western Texas planted more cotton. Cotton has also increased in Tennessee, Kentucky, and Oklahoma because the cold winters freeze some of the weevils and there are not so many to raise young the next spring.

Another way that farmers can get ahead of the weevils is to grow a kind of cotton that ripens early; that is, before there are many weevils to destroy it. The first week there may be two weevils; then twenty; then 200; then 2000; then 20,000; in a single summer, millions from two parents. If cotton ripens early enough, the farmer gets ahead of some of the weevils and gets most of the cotton.

Make a cotton map. Use the rainfall map you have made. Locate on the map seven important cotton ports. Use initials for the ports. Draw a line around the area where cotton grows. Draw a line that shows where the growing season lasts 200 days. Now tell what climate cotton likes best.

Some stories to tell. 1. From the pictures in the book, tell the story of cotton.

2. Cotton makes a speech: "How I do something for everyone," or "How I make the whole family work."

3. Cotton-boll weevil makes a speech: "How I moved the cotton crop," or "What I made the people learn."

Telling reasons. 1. Cotton grows well in the Southern States because..............................

2. Southern farmers were able to grow more cotton because ....

3. Cotton is a good crop because..................

4. Cotton growers had to plant other crops also because..............................

5. Tell what the storekeeper sells: (*a*) near a one-crop cotton plantation; (*b*) in a neighborhood of mixed farms growing cotton.

6. Which is better in a time of low prices, one crop or many crops? Why?

THE NEW AGRICULTURE

The weevil teaches a new agriculture. After the weevil army had made a good start across Texas, the people of all the Cotton Belt knew that their turn would come and that they could no longer depend upon cotton alone. Some of the wiser ones began to get ready for the change. Other crops must be grown. So the courageous farmers of the South changed to mixed farming, or *diversified agriculture,* if you like big words. It means the growing of several crops instead of one crop only.

Many ways to learn. The United States Department of Agriculture at Washington helped to draw up plans for the new agriculture. Each state has a state agricultural college where the problem was studied. Most of the counties of the Cotton Belt have a county demonstration agent whose job is to talk with the farmers, tell them about new crops, and show them how to raise them. In almost every county in the Cotton Belt the high schools have courses in agriculture to teach boys and girls how to grow crops and care for animals.

Boys' clubs and girls' clubs. In Georgia alone more than 30,000 boys and girls are members of farm clubs. In the United States over a million boys and girls belong to farm clubs. The plan of these clubs is that the members grow a small amount of something on the farm. They do it in the best way and try to get a large yield from their little plots. The boys grow an acre of corn, or cotton, or potatoes, or peanuts, or they raise some hogs, chickens, calves, or sheep. The girls cultivate gardens, can tomatoes, and make garments. Often the boys grow two or three times as much an acre as do the men of the neighborhood on their larger fields. A boy named Jerry Moore, of South Carolina, grew more than 200 bushels of corn on his

Fig. A. In Florence County, South Carolina, Jerry Moore, the farm-club boy whom you see in this picture, grew 228¾ bushels of corn on one acre of ground.

corn-club acre. What would that much corn cost near your home?

The farm that feeds itself. As a result of these various kinds of instruction, wide-awake people were better able to grow other crops when the weevil came.

In Georgia the farmers have what they call their *Cow, Hog, and Hen Program.* On the advice of the Georgia Department of Agriculture the farmers are raising more cows, hogs, and poultry. These provide milk, meat, and eggs not only for the farm home, but also to sell to the creamery, the butcher, and the grocer in the near-by town.

The helpful beans. Beans are important in this new agriculture. The bean family, with its many brothers and sisters, is of great use to man. It feeds him and his beasts and helps him to keep down the bill for fertilizer. Look at Figure 262-B. You will see that the roots of the bean plant have lumps on them. These lumps are made up of hundreds and thousands of tiny plants called *bacteria.* These lumps, or *nodules* of bacteria, on the roots of the bean family and also on the roots of the clover plants and on some kinds of trees, can do a wonderful thing. They can take plant food, called *nitrogen,* out of the air and feed it to the plant on whose roots

Fig. A. Hogs foraging on cowpeas and soy beans. This method of feeding is called *hogging down* or *feeding down* crops. Why could you say that the hog is a kind of farm laborer?

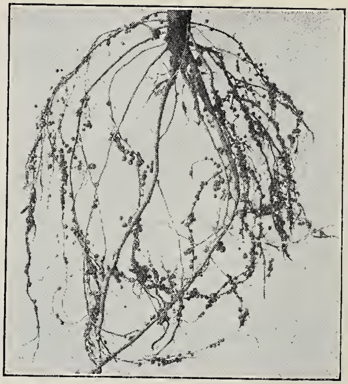

Fig. B. After you have read page 261, tell what the queer lumps are on the roots of this bean plant. What do they do?

they live. Not only do they feed their plant host, but they leave some food in the ground for other plants to eat later.

A sandwich for the cow. In the new mixed farming of the South, some farmers grow a kind of tall bean called *cowpeas.* Cowpeas sometimes grow to a height of three or four feet. The beans are good food for people and good also for feeding animals. In other places the southern farmers grow a kind of bean called the *soy bean,* which we got from China, where it had been grown for a long, long time. The cotton farmer often plants a field of corn, and when he cultivates the corn for the last time, he sows soy beans or cowpeas between the rows. After the corn is ripe and harvested, he harvests his beans; or sometimes he turns pigs or cattle into the field to eat the beans. Sometimes the animals are allowed to eat both the corn and the beans. We might call this a *sandwich for the cow.* This system of letting the animals harvest the crops is called *feeding down crops.* It is being used more and more widely in the Southern States.

Velvet beans. Another of the bean brothers is called the *velvet bean.* Sometimes one velvet-bean plant has enough long branches to climb to the tops of all the cornstalks that stand on twenty-five square yards of ground. Velvet beans are good feed for cattle, horses, mules, and hogs.

After the animals have eaten the bean crops, the ground is plowed, and it is always richer than if the beans had not been grown.

A monument for the weevil. Because of the new diversified farming, neighborhoods that once bought all their pork and beef and hay now grow enough feed for their horses and mules, and have cattle and hogs to sell. It is hard to believe it, but it is true that in one or two places in the Cotton Belt the people have put up monuments in honor of the boll weevil, because the little insect made them learn a new and better way of farming.

The battle with the ticks. The Cotton Belt is now one of the finest places in the world for producing meat. For a long time the cattle there were small, sickly animals. Men have found that this trouble was caused by a tick, but science has caught up with the destructive little rascal. This insect is like a tiny spider with short legs. It lives by sucking the blood of animals, especially that of cattle. If it sucks the

Fig. A. These cattle are grazing near a water tank on the high plains of Texas. What work does the windmill do?

blood from a cow having Texas fever, it carries the fever germs to the next animal it happens to bite. Thus it spreads the cattle disease. Men now destroy these ticks by dipping the cattle — ears, horns, noses, and all — under the surface of a tankful of liquid which kills ticks but does not hurt the cattle. Because of this discovery, big, fat cattle are now grown in the Cotton Belt. There has also been an increase in the amount of milk, butter, and cheese produced.

Corn and winter feed. Corn, which likes a warm, moist summer, grows well in all the Southern States except western Texas and western Oklahoma. It is the most important supply crop they have, and more of it may easily be grown. There is so little freezing weather in the Cotton Belt that oats, rye, and clover can grow nearly all winter. These crops make good pasture. Why do you think it costs more to keep a cow for a year in the North than it does in the South?

Fig. B. Soy beans growing between rows of tall corn. What other crops might be grown with corn?

Cattle in Texas and Oklahoma. Figure 254-A shows that a large part of Texas and the western part of Oklahoma are in the Great Plains. This has long been a cattle country. Indeed, Texas has more cattle than any other state, and Fort Worth is a great cattle market, to which about a million cattle are brought each year. The

Fig. A. A Virginia peanut gatherer and stacks of peanuts. The nuts dry in these stacks and are then threshed from the vines and sent to market.

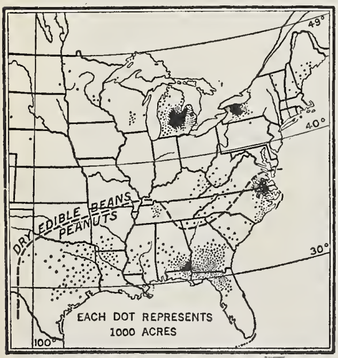

Fig. B. This map shows the parts of the United States where dry beans and peanuts are important crops. Dried beans are eaten mostly with bacon or pork as *baked beans*. Make a list of the different ways in which peanuts may be eaten.

city has large stockyards and meat-packing plants, which send meat to many cities in the South, East, and North. We may expect the cattle and dairy industries to increase in the South as more meat and milk are needed. The number of dairy cows is increasing in Mississippi and Tennessee.

The peanut — another example. The peanut is also a part of the new agriculture, and it is a good example of how industries grow. Slaves coming from Africa brought with them a few peanuts, a crop that they had grown in their home country for a long time. For many years they grew a few peanuts beside their cabins on the cotton plantations of the South. During the Civil War the soldiers from the Northern States tasted peanuts, and trade in these nuts soon began. For many years people ate them at the circus and at baseball games. Then came peanut candy and salted peanuts. Peanut butter became an article of table food, and peanuts became the basis of an important industry.

Peanuts (Fig. 264-B) are grown in many parts of the Cotton Belt. Georgia and Alabama are important peanut-growing states, but the greatest peanut district is in North Carolina and Virginia, southwest of Norfolk. In that city there are great warehouses for peanuts. Thousands of bushels are shipped to many states and countries. In the neighboring city of Suffolk there are many factories for cleaning and sorting peanuts and for preparing them for food.

Debate. Divide your class into two teams. Debate the statement: "Cotton planters should diversify their crops." Invite company to hear your debate, or give it at morning exercises.

Take a part. "I am a ...., and this is the story of my life." Boll weevil, peanut, velvet bean, cattle tick, nodule, Farm Club member, County Demonstration Agent, each tell a story in a few sentences. Let the class vote for the best and second-best story.

For those who like to read. Find out more about boys' and girls' clubs in schools. The Department of Agriculture at Washington has booklets.

A cotton planter's song:

"Ten-cent cotton and forty-cent meat,
How in the world can the poor man eat?"

1. The answer to the question in the song is d .... a ....

2. Make a list of plants and animals that might be raised for food by the planter.

Fig. A. The sandy soils of the Atlantic and Gulf coastal plains just suit vegetables. This is a field of spinach. The crop is being picked and packed in baskets for shipment. How does climate help people in the frosty North to have fresh spinach in winter? How do the railroads help?

CROPS FROM SANDY SOILS

Suppose that students from schools in the Southern States sent your school a wheelbarrow load of every kind of soil found in their group of states, and suppose that you dumped each wheelbarrow load of soil in a separate pile in your school yard. You would at once see that the Southland has at least five kinds of soil.

The pile of sandy soil. One wheelbarrow is filled with sandy soil of a light color. This kind of soil is found in much of that part of the Southern States that is shown in green on the maps, pages 252 and 254–255.

Once upon a time the land shown in green was not there at all. Instead, there was only the ocean. Now it is not water, but land. How did this change come about?

Streams cut and carry. The little streams began it. Streams of water, as they flow downhill, are always busy wearing away bits of the earth and loosening stones that happen to be in their path. Flowing water always wears away stone and carries the loose material (mud, clay, and sand) down to the larger streams. The larger streams carry it to the rivers. The rivers, always at work, night and day, winter and summer, year after year, carry some of this mud and clay and sand to the ocean.

For a long, long time, a very long time indeed, the streams in the Appalachian Highlands, the Ozark Highlands, and the highlands of Texas have carried material down to the sea. The streams dropped the clay and sand to the bottom near the shore. Year after year this went on until the rivers had deposited quite a thick mass upon the bottom of the shallow sea.

The sea bottom rose. Then something wonderful happened. Slowly, very slowly, the sea bottom rose and gradually became dry land. We call the new land the *coastal plain.* We know that this is a true story because the shells of sea animals are sometimes found on the land and in the earth beneath its surface.

Now we need to do something that will show us how water works and makes some of the different kinds of soils.

Fig. A. The sandy soils of the coastal plain make good watermelons in this Georgia field. When may they be eaten?

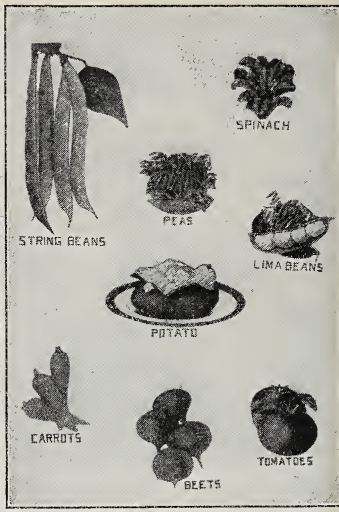

Fig. B. Name the vegetables which you see in this picture. They are not only good to eat, but are also very good builders of bones, muscles, and teeth. Eat some green vegetable every day.

An experiment

a. Fill a large glass fruit jar one third full of good building sand. Add one half as much clay or good soil that has been made very fine. You may have to dry it and pound it to make it fine. Mix the sand and clay together thoroughly. Put the mixture into the jar (or jars if they are not large) and fill it nearly full of water, but not entirely full. Screw a top on the jar and shake the jar twenty times, turning it upside down each time. Set the jar down and watch the sand settle. Let it stand until the next morning. Then look at the sand and clay without moving the jar. Write in your notebook what you notice about the sand and clay.

b. Again shake the jar and pour off at once into another jar all the water that will pour easily.

c. Fill the first jar with water again and shake it up as before.

d. Let it stand overnight and inspect. Write down what you see.

e. Shake it thoroughly again and pour off the water at once into a third jar.

f. Put water into the jar of sand several times, and shake and pour off until the water comes away clear.

g. Evaporate the water from all three jars and examine the material that is left in each. Write down what you notice about this material.

h. Get small flowerpots with holes in the bottom. Fill each with material from a different one of the three lots of material. Fill two pots with sand and mix a little good, rich garden soil with the sand in one of them. Examine them the next day and then the next. What difference do you notice?

i. Plant two or three grains of corn in each pot. Keep the pots in a warm place and water carefully. We shall need them later.

This sand-clay experiment shows what happens when a piece of sea bottom becomes seashore.

Sandy soils and truck crops. In some places the soil of the coastal plain is almost pure sand. Sandy soil does not contain much food for plants, but it is fortunate that all vegetables will grow well on sandy soils if some plant food is added. Two crops, the sweet potato and the watermelon, prefer sandy soils. Georgia leads in watermelons; Florida is second. Many watermelons are also shipped from South Carolina and Texas. The greatest sweet potato region in the United States is in

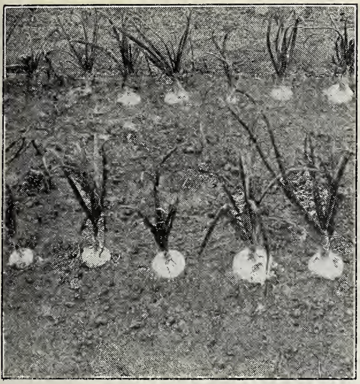

Fig. A. Onions growing on the coastal plain. How many carloads of these onions does your state buy in a year (Fig. B)?

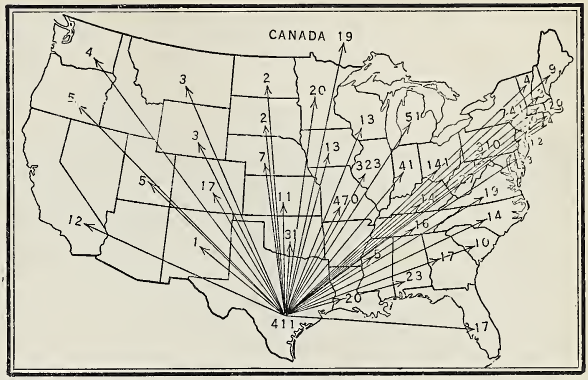

Fig. B. In April and May, Texas onions are shipped in carload lots to nearly every state and to Canada. How many carloads does your state buy? The figures show number of carloads.

the parts of Virginia, Maryland, and Delaware that make up the peninsula east of the Chesapeake Bay (Fig. 252-A), sometimes called *Delmarva*. Tennessee is also an important shipper.

To make better crops, southern farmers spend millions of dollars each year for the costly fertilizer that they empty from sacks and spread on their fields. The farmers are rewarded by having thousands of carloads of truck crops to sell.

The coastal plain. Light-colored, sandy soil is found on the coastal plain which extends through every state from the Hudson River to the Rio Grande. It extends far south along the Mexican coast. Most of the state of Florida is coastal plain. So is Cape Cod in Massachusetts; Long Island; southern New Jersey; most of Delaware; that part of Maryland east of Baltimore; the part of Virginia, North Carolina, and South Carolina east of a line passing through Washington, Richmond, a little east of Raleigh, N. C., then through Columbia, S. C., and Macon, Ga. The land that slopes to the Gulf of Mexico has a large area of coastal plain. Trace this coastal plain with your finger on the map, page 278-A.

The early vegetables. What do you remember about the vegetable business from the airplane journey which you took last term? What time of year was it?

This coastal plain is well suited to truck crops because of the sandy soil and the warm spring weather which comes very early along the Gulf coast and later travels northward along the Atlantic. The truck farmers plant large fields with lettuce, celery, peas, beans, beets, cabbages, early potatoes, tomatoes, watermelons, and other vegetables. You will often see twenty or thirty farm wagons and motor trucks loaded with vegetables at a single railroad station anywhere from southern Texas to Florida, and from Florida to New Jersey. What does Figure 267-B tell you about the onions grown in the Rio Grande valley of southern Texas? The spinach and the cabbages from the same locality go almost as far. A little later in the season the people in a score of states turn to Norfolk, Va., which is the center of the greatest truck-producing district in the United States. A farmer near Norfolk harvests his crop one day, and express trains bring it to the New York market the next morning.

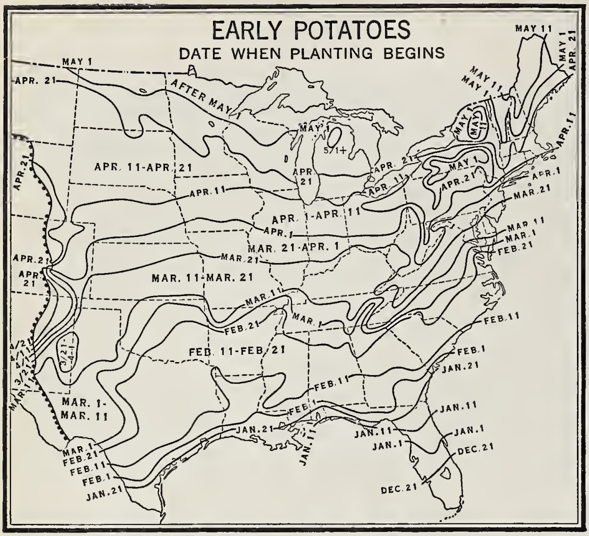

Fig. A. When do the Florida farmers begin to plant potatoes? the farmers near Lake Superior? Why is there this difference?

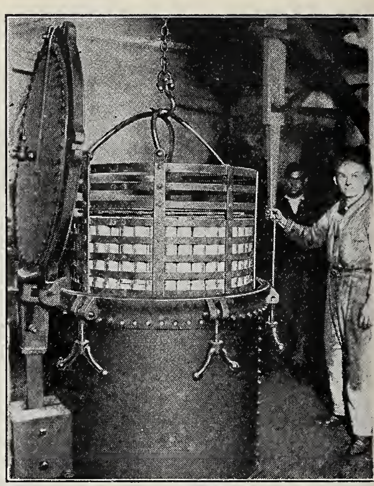

Fig. B. Many cans of vegetables being lowered into a cooker. The lid will shut tight, and steam under pressure will cook the vegetables at a temperature higher than that of boiling water.

Planting early. Since the first vegetables in the market bring the highest price, every farmer tries to plant early. But sometimes, if he plants too early, he is surprised by a frost that kills everything. Then he must plant again. One year a Florida farmer had his young plants frozen three times. But he planted the fourth time and made money on the crop. The time of ripening of crops moves north in the same way that planting time moves north (Fig. 268-A). What does this map tell you about the length of the season when early potatoes are being dug in the Southern States? Virginia ships more of this crop than any other state; most of her potatoes are grown on the soft, sandy soil of the coastal plain (Fig. 267-A).

The railroads are in such a hurry to get the southern vegetables to market that they will sometimes let one of the fast passenger trains from the North wait on a siding while a trainload of cabbages rushes past on its way to northern city markets.

Canned vegetables. On the peninsula between Chesapeake Bay and Delaware Bay great quantities of fruits and vegetables are canned in factories for winter use. Maryland is first in the canning of tomatoes. Baltimore is one of the greatest canning cities in the world, because of the supplies of fruit and vegetables brought by the many boats that go up and down the rivers and deep creeks flowing into Chesapeake Bay. Many farmers along the shore have their own boat landings. When you go to your grocery store, look for some Maryland addresses on the cans of fruit and vegetables. You may also find California addresses, for California, too, has many vegetable fields and canneries.

Oranges and grapefruit. The groves of oranges and grapefruit that we saw in our airplane journey across Florida (page 217) give that state her greatest industry. For weeks at a time, trainloads of grapefruit and oranges leave Florida daily for many northern cities. Some oranges are grown in Alabama and Louisiana, and a few in Mississippi, but the lower Rio Grande

Fig. A. Picking time in a large Florida grapefruit grove. What would this grove be worth if Florida had no fast-freight service to other states?

valley has the largest orange and grapefruit orchards anywhere in the Southern States outside of Florida. This crop is increasing rapidly in this warm corner of Texas.

Peaches. Georgia ships more peaches to market than any five states east of the Rocky Mountains. A variety of peach called the *Elberta* is the chief market variety. It is ripe in the Georgia peach district early in July. The same variety is ripe in Virginia in early August; in Maryland and Delaware in late August; and along the shores of Lake Ontario in September.

Strawberries. Tennessee, Arkansas, Louisiana, and North Carolina are often rivals for leadership in the shipment of strawberries. For short periods each state in turn supplies a large part of the United States.

Making sentences. Write sentences about the Southern States, using the words: delta, coastal plain, deposited, fertilizer, truck farm, market.

A living story. 1. Let someone start the story thus: "I am *sandy soil;* this is the way I was made ...."

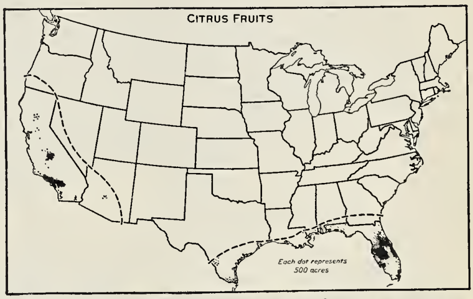

Fig. B. Which states lead in the growing of citrus fruits?

2. The next person says: "I am a truck farmer. I use sandy soil for ...."

Radio talk. Begin by saying, "This is Station *C-O-L-D*." Continue your talk by describing some scene or occupation in the North in March. The second talk is on the same day from Station *W-A-R-M*, and is about life at a southern resort or on a southern truck farm. You may choose the place about which to talk. Have your teacher or two pupils from a higher grade act as judges. Pretend that a prize is being awarded for the best talk.

A pointing game. Divide the class into two teams. One team calls the name of a place. The other points to the place on the wall map. Allow five seconds for each play. Have a leader keep time and score.

FLOOD PLAINS, THE RIVER SOILS, SUGAR, AND RICE

The second pile of southern soil. The second pile of soil in your school yard is dark brown in color and almost as fine as flour. It is very different from the first sample. This soil feels like that in one of the pots of earth in our sand-clay experiment (page 266). This is the kind of soil that rivers have made with the mud of their waters. A river sometimes overflows its banks, and water then covers the low plain beside the river. Plains that are sometimes flooded by rivers are called *flood plains.*

Flood-plain soil. Flood plains are usually rich in plant food because of the mud or silt which settles on the plain when the muddy river overflows. Such soil made of silt is called *alluvial soil.* It is soil that water has carried to its place. Watch the corn plants in your sand-clay experiment, and see what they show you about the plant food in the clay. There are hundreds of long strips of flood-plain soil along the rivers and creeks of the Cotton Belt, and in many other parts of the world.

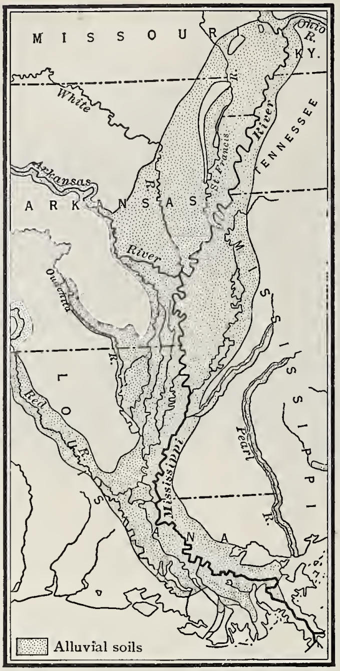

Fig. A. The shaded part of this map shows the alluvial soils of the lower Mississippi Valley.

Fig. B. Map of the Mississippi River delta. All the dotted part of this map represents land built up by the Mississippi River since 1872.

The Mississippi flood plain. The largest of these southern flood plains is along the Mississippi, the largest river in North America. Each year the muddy Mississippi dumps into the Gulf of Mexico enough earth to cover 278 square miles with a layer one foot thick. It has been doing this for thousands of years, and river work has built up the land along the Mississippi River from Illinois to the Gulf. Look at the map (Fig. 255-A), imagine that the Gulf reached as far inland as Illinois, and you will understand something about the work of rivers. The area of river-mud land along the Mississippi is as large as that of the states of Maryland, Delaware, New Jersey, Connecticut, and Rhode Island. No other big block of land in the United States has such great possibilities of crop production. This good land is found in six states. Find their names from Figure 270-A. The river soil (alluvial soil) is so rich that good crops of cotton can be grown on the same field for many more years than it can be grown on the sandy coastal-plain soils.

A city on the silt. There are no stones on this alluvial plain. You can dig down a hundred feet and find only soft earth or clay or sand. In New Orleans, which is built on this low, flat plain, the water in the ground is very near the surface. If a large, heavy building were set directly upon this soft earth, it would sink and even fall over on its side. To prevent

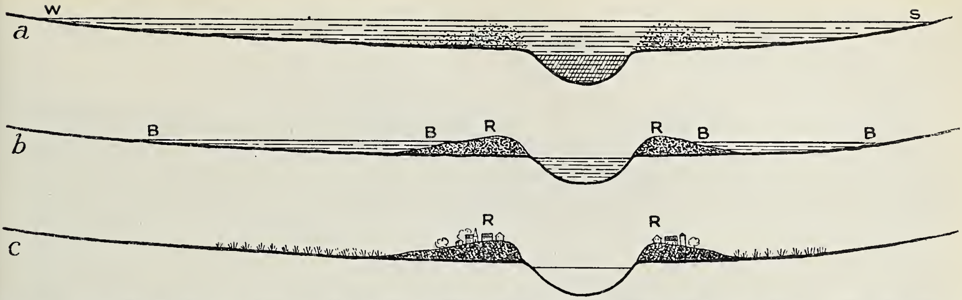

Fig. A. In *a* the letters *W-S* show the surface of water when a river covers its flood plain. The overflowing water of the river drops more mud and sand near its bank than it does farther back. These build up the earth and are called *natural levees*. Tell how they are used. Find the river and the back water in *b* as the floor goes down. Find the swamp in *c*.

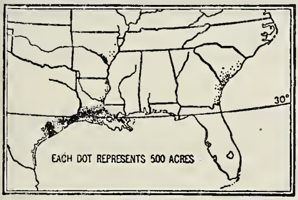

Fig. B. Where rice is grown in the Southern States. California also grows rice. Why is so much rice grown along the coast of the Gulf of Mexico?

Fig. C. The map at the right shows all the drainage basin of the Mississippi River. Why do you suppose the Mississippi is sometimes called "The Father of Waters"?

such trouble, piles (the trunks of trees) are driven into the ground. A bed of cement is laid on the piles. The piles and cement hold the foundation walls of heavy buildings. Logs that are under water all the time keep sound for hundreds of years.

The fight with a river. When the snow melts in the North Central States and in the Appalachian Mountains, the water rushes down to the rivers. Often, at the same time, heavy rains pour water into the many rivers that flow into the Mississippi. So much water often raises the great river until it overflows its banks and covers large areas of the level land beside its banks. This does not happen every year, however, and many plantations have been made on these rich flood lands.

Levees — walling in the river. Because floods do such great damage, men have worked for years to build high banks, called *levees*, along the edges of the Mississippi, hoping that the earth banks will hold the water back in times of flood (Fig. 272-A). Sometimes the levees break. Sometimes the river rises even higher than the levees. Then water rushes down the banks of the river, tears a great hole in the levee, and flows across the country, covering up hundreds, even thousands, of farms, and driving thousands of people from their homes. Many of these people

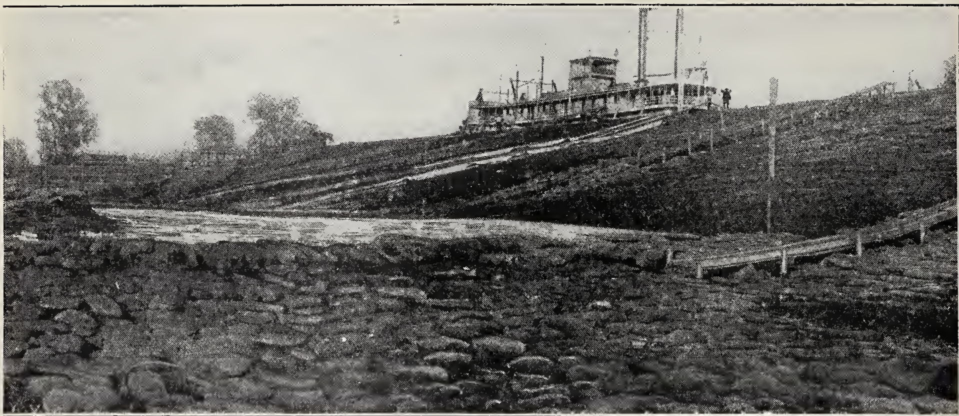

Fig. A. The hill is a Mississippi levee. The steamboat shows that the water of the river is near the top of the levee. If a break occurs in the levee, bags of sand or earth are piled in the break to prevent the gushing water from tearing a larger hole.

are taken away in boats that have been sent to rescue them.

Our greatest flood. In 1927 the greatest winter and spring rainfall ever known came to parts of the Mississippi Valley. The river rose and rose until it ran out through the levees in dozens of places. It flooded an area as large as Massachusetts, Rhode Island, and Connecticut. It drowned hundreds of people and thousands of horses, mules, and other farm animals. It drove six hundred thousand people from their homes and spoiled their houses and furniture with a thick layer of mud. But the fields that were flooded were fertilized well enough to grow several fine crops.

Our government is trying hard to control the Mississippi by building levees for protecting the banks, jetties for deepening the channel, and spillways for carrying off the water. When this is done, the Mississippi flood plain will be the richest and most productive farm area in the United States.[1]

[1] Doctor Smith, the author of this book, has written two magazine articles about the great flood of 1927. They are entitled "Plan or Perish" and "Wealth from Mississippi Mud." These stories are excellent supplementary material—valuable for problem work. They may be had, both articles in one pamphlet, from the John C. Winston Company for five cents, the cost of mailing.

A sugar plantation. Where are our sugar-cane plantations (Fig. 273-B)? They are on river-made soils.

A sugar plantation sometimes has ten thousand acres. Most of the work is done by Negroes. They can work in this hot and damp climate better than can white men. There may be several villages of Negro workers on a sugar plantation. A sugar plantation differs from a cotton plantation in several ways. The cotton plantation is worked by tenants. The sugar plantation is worked by people who are hired by the owner of the plantation because he must be sure to have a large quantity of cane to keep his factory going.

On the cotton plantation are only a few buildings used as living quarters for the workers, and some small barns for the mules. On the sugar plantation is a large sugar mill. In the mill are great steam engines and boilers having the power of hundreds of horses. The engine drives strong, heavy steel rollers, which crush the juice from the sugar cane.

Sugar cane. The cane plant looks something like a cornstalk. Corn is chiefly useful to us for its big seed. The cane is

Fig. A. Cutting sugar cane in Louisiana. See Figure 273-B for beet-sugar districts in the United States.

valuable for its sweet juice. Children like to suck cane for its sweet taste. This juice, after being crushed out of the cane by heavy rollers, is put into tanks almost as big as rooms. There it is boiled to drive off the moisture. What is left is brown sugar, from which white sugar is made. The part of the juice which stays in the form of a black liquid is molasses. A ton of Louisiana cane makes from 100 to 150 pounds of sugar, and about six or eight gallons of molasses.

The cane farmer plows his land early in spring and plants short pieces of cane in rows. The cane sprouts and grows as corn grows. It takes three tons of stalks to plant an acre. At harvest fifteen to twenty tons of cane will be cut from each acre. Until late summer the cane must be cultivated as cotton is cultivated. By this time the cane stalks are so tall and the leaves are so thick that no weeds can grow in the shade beneath them. Cane harvest begins in October. This is the busiest season of the year. The tops are cut off and the leaves are stripped from the stalks, which are then cut and hauled to the mill for crushing. A wagon usually hauls the cane a short distance to a little plantation railroad. It is put on the cars and hauled a mile or two to the mill. A sugar mill must be so large that it needs the cane from many hundred acres to keep it busy.

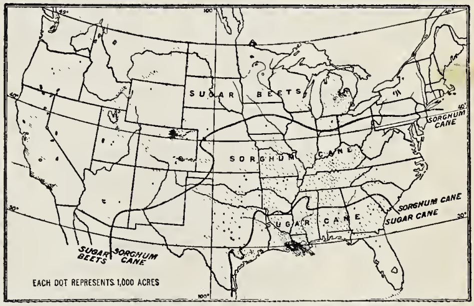

Fig. B. We get sugar chiefly from three plants. Name them. Point to a state in which each plant is widely grown.

Sugar and climate. Cane needs at least eight months of warm weather, and the hotter the weather, the better it grows. If the warm season can be longer than eight months, there will be more sugar in the cane stalks. If there were no frost, the roots would live for many years. In some of the hot parts of the world the growers cut cane from the same plants for ten or fifteen years. In Louisiana they often cut a crop the second year, but it is smaller than the first year's crop.

Some of the Louisiana sugar growers have a crop rotation. After the sugar cane

they will plant corn, and then cowpeas or velvet beans. After the cattle have eaten some of these, the rest will be plowed under to fertilize the fields for the next cane crop.

Machine-made rice. Rice is another crop that does well on the alluvial soils. Rice came to us from Asia. The Chinese and Japanese peoples have grown rice for many centuries. The plant is naturally a swamp plant. It likes to grow in the water. Since colonial times, rice has been grown in the swamps along the coast of South Carolina and Georgia. As in China and Japan, our rice was planted in little fields which were flooded with water to the depth of a few inches. When the rice was almost ripe, the water was allowed to run off, and the crop was cut with sickles by hand, as is done in China and Japan. Sickles in men's hands make high costs; therefore we use machines in this country if we can. We have even learned how to grow rice with the help of machinery. On the wide, level plains of Louisiana, eastern Texas, and Arkansas we plow rice fields with tractors. We use tractors and road-grading machines to heap up the banks and hold the water on the fields. Engines pump the water into the fields, and finally we harvest the rice with reapers as we harvest wheat.

Draw a line map of the Mississippi River system. Draw one line for the main river and one for each of its main branches. Name some of the tributaries. Mark the rice areas (Fig. 271-B) with close parallel lines. Do the same for the sugar areas (Fig. 273-B).

Stories to tell. Tell a story:

1. About the foundation for a big building on two kinds of earth.
2. About a plantation; levee; boat; silt; alluvial soil; flood plain; fertility.
3. About a little stream near your schoolhouse that carries particles of earth.

For those who like to make things. 1. Make a model of the United States in sand, clay, or flour and salt. Show the mountains, the source of the Mississippi, the tributaries, Gulf of Mexico, the delta.

2. Use pan, basin, or deep dish. Put a layer of clean sand in the bottom. Cover it with an inch or two of very muddy water. Evaporate the water. Use the result to help explain the statement: "Father Mississippi helps 'his children,' yet they fear him."

Conversations. 1. Use these words in talking or writing about sugar: Louisiana, rotation, mill, crushing, plowed under, cane, molasses.

2. Use these words in talking or writing about rice: Texas, Louisiana, tractors, reapers, engines, pumps, threshing machines.

THE BLACK SOILS, THE RED SOILS, AND TOBACCO

The limestone and the black soils. Let us go back to the wheelbarrow loads of southern soils in your school yard and look at the black pile. Many of the boys and girls of the Southland live on this fine, soft, black, rich soil. Long, long ago the sea helped to make it rich.

In some places the sea bottom is covered many feet deep with the shells of shellfish, such as oysters, clams, mussels, and many others which live in the sea. These little animals get lime from the sea water. It makes their shells. When the shellfish die, these shells lie on the bottom of the sea. They pile one upon another and finally become great banks of limestone. In this way all the limestone in the world has been made. This shows us how the sea once covered places that are now dry land. Sometimes these piles of shells are mixed with sand and clay, making impure limestone.

Material for limestone is still being put on the bottom of the oceans where shellfish leave their shells.

You may wonder why limestone soil is rich soil. It is because limestone contains phosphorus. Without phosphorus a plant or a man would starve to death in a short time. When soil is made of rotted lime-

stone, it is nearly always rich because it contains phosphorus. The South has some areas of limestone soils that are known far and wide because of their richness.

The cotton map (Fig. 256-A) shows much cotton in central Texas and in central Alabama. This is because both districts have rich black soil made of decayed limestone rock. The soil is black even if the limestone is white like chalk. Chalk is a soft limestone made of very, very tiny shells. The farmers on the black limestone soils of Texas and Alabama can grow big crops of cotton year after year. In Texas the limestone belt is called the *Black Land* or *Black Waxy*, and the man who owns a farm there is fortunate. To the east of the black land the soil is more sandy and often poor; therefore much of it is still covered with forests of pine and other kinds of trees.

The limestone belt in central Alabama and eastern Mississippi is called the *Black Belt*. The land sells for five or six times as much an acre as the less fertile sandy land near by.

The pile of reddish soil. The fourth pile of earth is reddish in color. It is clay. It feels hard in your hand. You can feel grains of sharp sand in it and a few tiny bits of stone. This soil is from the uplands between the coastal plain and the mountains. These uplands are called the *Piedmont* (Fig. 275-A). Clay is also the soil of the valleys between the mountains, and of fertile limestone plains in central Kentucky and central Tennessee.

Clay soils are richer than sandy soils, and grass grows well in them. Therefore they make good pasture lands for cattle, sheep, and horses. As you travel across the coastal plain with its truck farms, you see few fences, for the farmer does not keep animals; but if you travel across the Piedmont of Maryland and Virginia, or the plains of central Kentucky or Tennessee, you see fences and animals on nearly every farm.

The farmer on the rolling Piedmont lands of northern Virginia and Maryland often has a field of corn, a field of wheat, a field of hay, and some pasture fields. Many farmers keep cows and send their milk to the city markets in Washington and Baltimore.

Leadership in tobacco. These fertile clay soils are also good for the tobacco plant, a hungry fellow that needs rich land to make it grow well. This plant, which the white men got from the Indians, has in it the poison *nicotine;* but we have already found that tobacco brought money to the early colonists. It has since become the money crop for thousands of families in the Southern States. It takes a great deal of work to grow a field of tobacco. Much of it is work that boys and girls and women can do. The field must be plowed as for cotton or corn; the ground between the rows of tobacco plants must be stirred with a plow as are the cotton fields; the weeds must be hoed out from between the plants. Worms get on the plant and eat holes in the leaves; these must be picked off one by one and

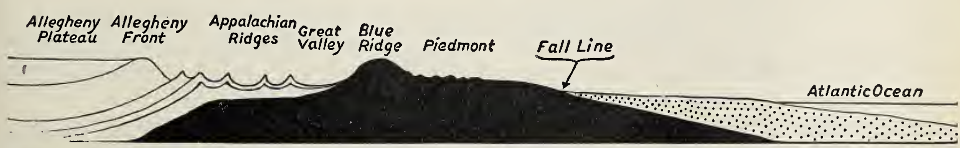

Fig. A. A cross section of our country from western Maryland to the Atlantic Ocean. Find the rolling Piedmont.

Fig. A. Hanging up green tobacco to cure in a tobacco shed near Louisville, Kentucky.

Fig. C. A field of tobacco in Tennessee. The county agricultural agent is teaching two farm-club boys some important things about growing tobacco.

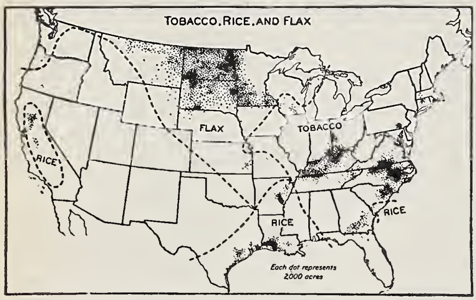

Fig. B. This dot map shows where tobacco, rice, and flax are grown in the United States. Name a leading state for each crop.

destroyed. The plant must not be allowed to bloom, as making seed spoils the quality of tobacco; so dozens of little buds must be picked from each plant. The sharp eyes and quick fingers of boys and girls and women can do this as well as men or better. When the tobacco is ready for harvest, each plant is hung up by itself to dry or cure in a barn or shed. Finally, the parts of the tobacco leaf must be separated from the leaf stem by hand.

The tobacco industry was started in Virginia and is still very important on the Piedmont in the south-central part of that state. Much more is grown in central North Carolina. South Carolina and Georgia also share in the industry. For a long time, Kentucky was first in tobacco. Kentucky has a plain with a rich limestone soil covering thousands of square miles around Lexington. This is called the *Kentucky Blue-Grass Region* because the fields are covered with rich green grass called *blue grass*. This kind of soil makes good corn, hay, and pasture, and many fine horses are raised there. But the land is also good for tobacco. Most farms have a small field of tobacco every year. The farmer plows up a thick blue-grass sod, and, as this decays, the tobacco roots feed upon it. Much tobacco is also grown in western Kentucky and in the near-by parts of Tennessee.

Every year buyers from France, Germany, Switzerland, Italy, and Spain visit the world's greatest tobacco markets at Louisville and Lexington, Kentucky, and Wilson, North Carolina. The export of tobacco pays for millions of dollars' worth of foreign goods each year.

In Richmond, Virginia, Winston-Salem and Durham, North Carolina, are many factories that prepare the leaf for use.

Fig. A. Louisville, Kentucky, as the airman sees the city. What river do you see in the picture? At this point are falls in the river which are used to make electric power. See the canal around the falls.

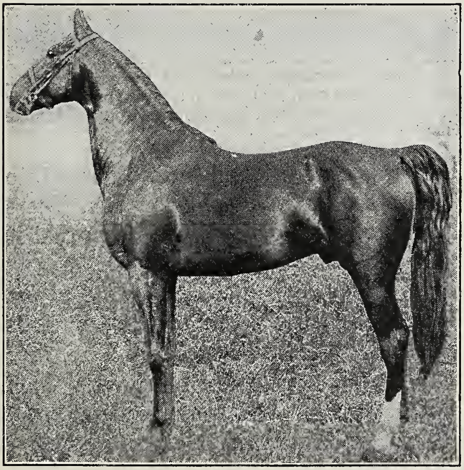

Fig. B. The rich pastures of the Piedmont and of the Blue-Grass Region of Kentucky are the home of the thoroughbred horse.

North Carolina leads in tobacco manufacture, and Norfolk is the greatest tobacco-shipping port in the world.

Where is it? On an outline map of the United States locate the black belts of Texas and Alabama. The cotton map (Fig. 256-A) will help you. Also put on the map the Mississippi Flood Plain (Fig. 270-A) and the chief tobacco regions (Fig. 276-B).

A new word. 1. Find from your dictionary the definition of *autobiography.* 2. Give the autobiography of a leaf of tobacco. Be sure it has in it the word *education.*

3. Give the autobiography of a shell in which something once lived.

Swapping stories. Two southern farmers have a long talk. One starts with, "I have a black-waxy farm ...." The other says, "I have a sandy farm ...." Complete each conversation.

Puzzles. 1. Tell how soil may decide whether or not a farm has fences.

2. Does a cow care what kind of soil makes the farm where she lives?

Lime circuits and water circuits. 1. The lime in the limestone goes into the earth; then into the water in the earth; then into the grass; then into the bones of the horse; then into bone-meal fertilizer. That is one lime circuit. Now tell the various steps in another lime circuit.

2. Tell the steps in a circuit that the water makes, and some work that it does in passing.

Writing questions about the story and about the pictures. Write four questions for your classmates to answer about the story; about the pictures on pages 275–277.

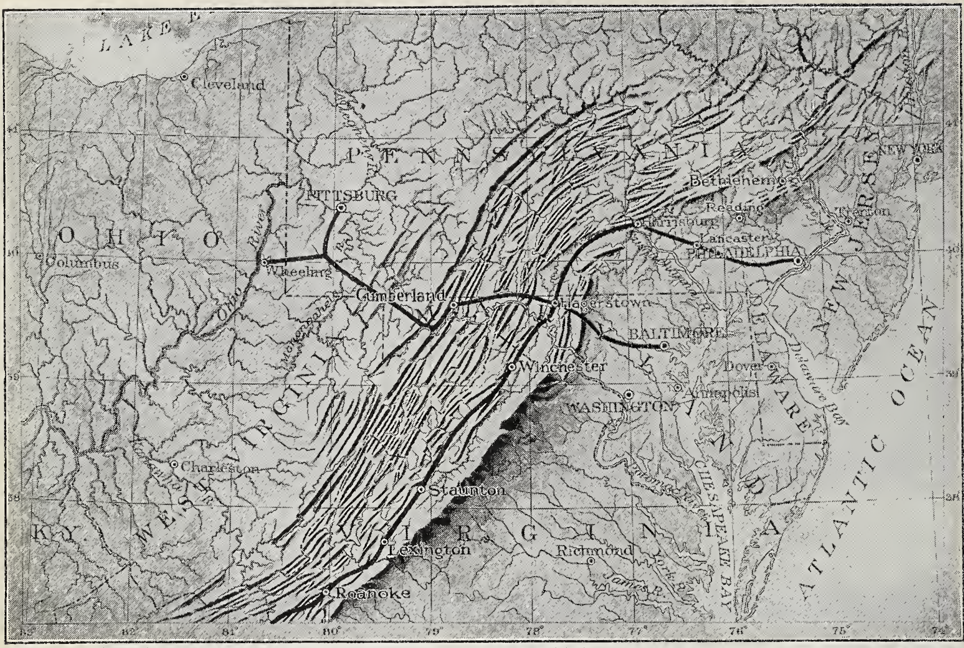

Fig. A. This kind of map is called a *relief map.* It shows chiefly mountains, plains, and bodies of water. Point to a low, level plain east of Baltimore; to a high mountain ridge from near Roanoke to Hagerstown; to many smaller ridges between Hagerstown and Cumberland. The old wagon road from Harrisburg through Roanoke ran down the Great Valley. Compare with Figure 275-A.

THE RED SOILS, THE STONY SOILS, AND THE MOUNTAINS

Thermal belts. The clay soils that are so good for grass and tobacco are also good for apples. The trees grow large and strong, and sometimes live to be a hundred years old. The climate of the uplands in the Southern States also suits the apple tree. Many orchards in many parts of the world are on hills, or uplands, because of a curious fact in the climate of hills and mountains. On cold nights, when there is no wind, the coldest air, being heaviest, sinks into the valleys, which thus get colder than the hillsides from which the cold air has drained. If the valley is not entirely filled with freezing air before sunrise, plants on the hilltops and higher slopes do not freeze. On an October morning I have stood on a mountain side where there was no frost and looked down into a valley six hundred feet below me. There the ground was so white with frost that it looked like snow. This movement of cold air in mountain-valley lands is called *air drainage,* and the warm belt higher up is sometimes called a *thermal belt.*

Thermal belts do not reach very high on the sides of *high* mountains like the Rockies or the Sierra Nevadas; but are very important on their lower foothills. As the hillsides and hilltops are safer from frost than the flat valleys below them, many orchards in the Appalachian ridges and valleys (Fig. 279-A), and elsewhere in the world, are planted on the slopes and tops of hills, and on the sides of mountains.

Sometimes the frost line is so sharply marked that the fruit buds on the trees

Fig. A. Part of a 700-acre apple orchard on the side of an Appalachian ridge near the Maryland–West Virginia boundary. Tell how the Potomac River Valley helps the apples get to market.

along the lower side of an orchard may be frozen and killed, while those a little higher up in the same orchard escape frost and make a good crop.

Appalachian apples. The Appalachian ridge region of Maryland, Virginia, and West Virginia (Fig. 278-A) is one of the best places in the United States for fruit because each ridge is a thermal belt. Fruit trees on these hillside farms have grown so well that many thousands of acres of peach and apple orchards now cover the mountain sides near the Potomac River. Orchards are situated at points where the through lines of railways permit fruit growers to ship their crops eastward to the cities on the Atlantic slope, or westward across the plateau to Pittsburgh and other cities.

There are also many apple orchards south of the Potomac River in the hill country of Virginia and North Carolina.

Ozark orchards. The same fruit-growing conditions are found in the uplands of the Ozark Mountain region. This northern part of the Southern States, with its many large orchards, sends carloads of apples and peaches to the orange and truck sections and to all Southern States. But if the price of cotton is low, the Cotton Belt people cannot buy many apples from the people farther north.

Science helps the fruit industry. Growing fruit is another industry that shows how science can be made to help man fight his plant enemies and insect enemies in the work of getting food and materials. The apple tree that blooms so beautifully in the spring has on its twigs tiny spores or seeds of little *fungi,* which make ugly black spots on the apples. You can see fungi by letting some food get moldy. On fruit-tree leaves there are also little green, juicy-looking insects called *aphids,* and other insects which bite or sting apples and make them knotty. A moth, called the *codling moth,* lays eggs which hatch into little worms that eat their way into the green apples, live there, spoil the apples, and come out to fly away as moths and lay more eggs.

With all these enemies attacking apples, you may wonder that you ever get an apple

Fig. A. The far-away mountain farm in the Appalachians. This picture might also have been taken in the Ozarks, for the Ozark-Ouachita Highlands (Fig. 255-A) are much like Appalachia. The visiting nurse finds the horse the best means of travel in these mountain lands. What does the picture tell about this farm?

at all. Science has helped the fruit industry; it even helps orchardists to raise *good* apples. A farmer who grows apples has a tank on wheels which he fills with poisonous liquid and hauls through his orchard. A motor pump forces the liquid up through the trees in a fine mist or spray which wets the apple tree with poison. What do you suppose happens then to bugs and worms when they try to bite a little green apple? The spray contains strong liquids that also kill the little fungi. With their enemies defeated, apples have a chance to grow large and smooth. Without the poison spray, most of them would have been knotty, wormy, and blotched. As the summer passes, the rain washes the poisons off and none is left on the apples at picking time.

The pile of stony soil. The fifth and last pile of soil in your school yard has many stones in it. Some are as large as the end of your finger; many are the size of your fist; a few are as large as your head. This is mountain soil. It comes from land so steep that the running water has carried much of the soil away, almost as fast as it was formed, by the breaking up of rocks. Most of the mountain soils have plenty of plant food in them, but their surfaces are too steep and stony to be easily plowed. When they are plowed, they are so steep that the soil washes away very rapidly in every thundershower. After a few crops of corn, the mountain farmer often leaves his field to grow up in woods again.

The far-away mountain farm in Appalachia. More than a hundred years ago in the United States nearly every farm and

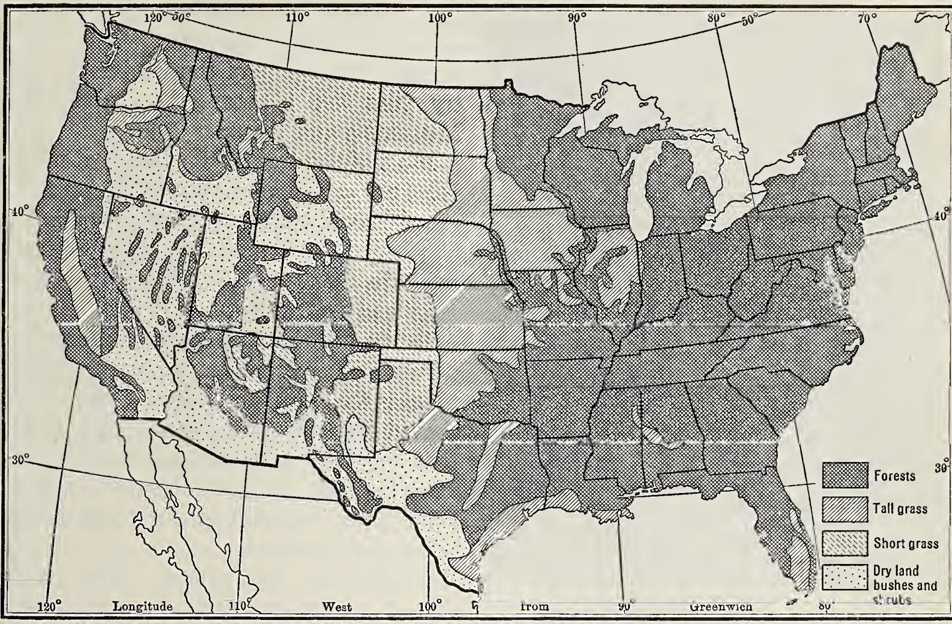

Fig. A. If you had visited the United States before the landing of Columbus, you would have seen our country covered with trees and other native plants as shown in this map. Notice the part which was covered with forests.

every country neighborhood made almost all of the things it used. At that time the American people were going west, cutting down the forests, and making homes. Many of these people stopped in the Appalachian Mountains, and thousands and thousands of their great-grandchildren still live there. Many of them live far up in little valleys or high up on steep hills and mountains where it would cost so much to build a road that they have no roads at all. They can sell very few things indeed; therefore they have very few things in their houses. Many of them move down from the mountains to look for jobs in the towns.

Now you see why most of the Appalachian uplands are still in forest, as all were when the white man first found them. It was a mistake to try to make so many farm homes in the Appalachian uplands.

Make a profile. Study carefully the profile in Figure 275-A. Find the Piedmont and the Appalachian ridges. Now draw a profile two inches high and as wide as this book, showing an Appalachian ridge and valley. Print in the right places the words: hilltop, slope, thermal belt, valley, frosty ground, orchards. Show orchards by tiny trees.

An autobiography. Write a short autobiography beginning either with

1. "I am an apple tree. I need ...."
2. "I am a gully in a cornfield ...."

Explaining differences. Explain the difference in things bought and sold on a farm:

1. On a good automobile road.
2. Far up in a mountain valley where no automobiles can go. Say something about Figure 280-A.

Soils of the Southern States. Make an enlarged copy of the following chart and fill it in.

Soils of the Southern States

Kind	Location	Crops

Fig. A. The trees are pine trees. A cut is made in the tree. The sap flows from the cut and collects as a thick, sticky mass in the buckets. The sap yields turpentine and resin when boiled in a still.

LUMBER AND THE FOREST PROBLEM

As you read this section, try to answer this question. We are cutting lumber in this country about three times as rapidly as it is growing. What should be done about it?

Lumber. How much of the Southern States was naturally forested? (Fig. 281-A.) You have already learned from the story of cotton that most of the Southern States have a long, warm summer with plenty of rain. This makes trees grow rapidly. Knowing these two facts, you will not be surprised to learn that the Southern States furnish a large part of the lumber used in the United States.

Lumber on the hills and mountains. In the Southern States trees are cut from three entirely different kinds of places — mountains, plains, and swamps. The steep and rocky land should be kept forever producing lumber. You will find such places in the Ozark Mountains of Arkansas (Fig. 222-A), the Appalachian Mountains and plateaus of Tennessee, Kentucky, North Carolina, Virginia, and West Virginia, and some of the Piedmont country that lies between the Appalachian Mountains and the sea.

Most of the trees of the hills and mountains are oak, poplar, walnut, hickory, the broad-leaved trees which grow well in the clay soil of the mountains. The men who haul the logs here often have to work in very rough places indeed.

In the alluvial soils grow fine forests of oak and other broad-leaved trees. Among these is the gum tree, whose wood can be shaved into the thin layers, called *veneer*, that are used to make berry boxes and fruit baskets, or glued together to make thin, strong boards used for making large boxes and furniture.

Lumber on the plains. The sandy soils of the coastal plains are covered with pine trees, for the sandy soil suits pine trees better than it suits the broad-leaved trees. Much of the southern pine is the kind called *long-leaf pine* or *hard pine*. It is used in nearly all parts of the country for making floors of houses. Millions of acres of this forest have been cut. It is not so hard to cut lumber here as in the mountains. Why is this true?

Unfortunately, the young trees on millions of acres have been destroyed by fires that have run through the woods almost every year. The fires are sometimes started by people who want the little trees killed so that huckleberry bushes may grow or so that they may have grass for pasture. Hogs that run loose in the woods also dig up little long-leaf pine trees to eat their fat roots. In some places, where the lumber companies are trying to prevent fires, the young trees are growing very rapidly indeed.

Swamp lumber. Swamps are the third kind of place where lumber is cut. The

heavy rain falling on the flat lands, where it cannot run off rapidly, makes large areas of wet lands along the coasts and along the Mississippi and other rivers. The largest of these wet lands, the Everglades of Florida, is treeless (page 217), but the cypress tree can grow in many southern swamps. Most trees need to have air in the ground where their roots are, and cannot grow in water-soaked soil, but the cypress tree manages to stick some of its roots out of the water and live in the wet earth. The cypress is a splendid wood for making shingles that will last a long time, and is beautiful as interior woodwork for houses. To get the logs out of the swamp, however, is a difficult job.

Lumber trade. Find the city of Memphis on the map (Fig. 255-A). Do you see that the Ozarks are on one side and the Appalachians on the other, and that the rich lowlands of the Mississippi Valley surround it? Are these facts reasons why Memphis is the greatest hardwood lumber market in the world? It sends out many kinds of wood manufactures, including golf clubs for Scotland.

The South supplies itself with lumber and sends thousands of carloads to northern cities. Many ships loaded with lumber sail from every port between Galveston and Baltimore. For a time the small city of Gulfport, Mississippi, with many forests near it and railroads running through them, was the greatest lumber-exporting port in the world.

Furniture. Now that manufacturing has begun in the South, many of the cities, especially in North Carolina, have put up furniture factories and are sending out carloads of finished furniture instead of carloads of planks, beams, and logs.

Something to explain. 1. Why should mountain sides be kept in forest?

2. What is the relation between trees and the trade of Memphis?

Fig. A. In the swamp forests of the Mississippi flood plain grow the gum, cypress, and other water-loving trees. The tree in the foreground is a tupelo gum.

Building the map. Mark on your outline map of the United States all the land in the Ozark and Appalachian uplands that has an elevation of more than 1000 feet.

Stories to tell. Tell any one of the following stories:

1. "I am the forest fire."
2. "I am the fire fighter."
3. About the pig, the pine tree, and the cost of a new house after a while.

A convention. Pretend that the class is a convention of lumber merchants discussing problems of production, supply, and markets. Have a chairman and speakers.

For those who like trees. Find what bulletins about trees and lumber can be had from the Forester of your state; from the Bureau of Forestry at Washington.

Lumber markets and furniture. 1. Ask a local furniture dealer to tell you where some of his furniture is manufactured. Be sure to tell him why you want to know, and thank him for his trouble. Is any of his furniture made near your home? Where?

2. Why do North Carolina and other states send out furniture instead of lumber?

5. Of what is the furniture in your schoolroom made? the schoolhouse?

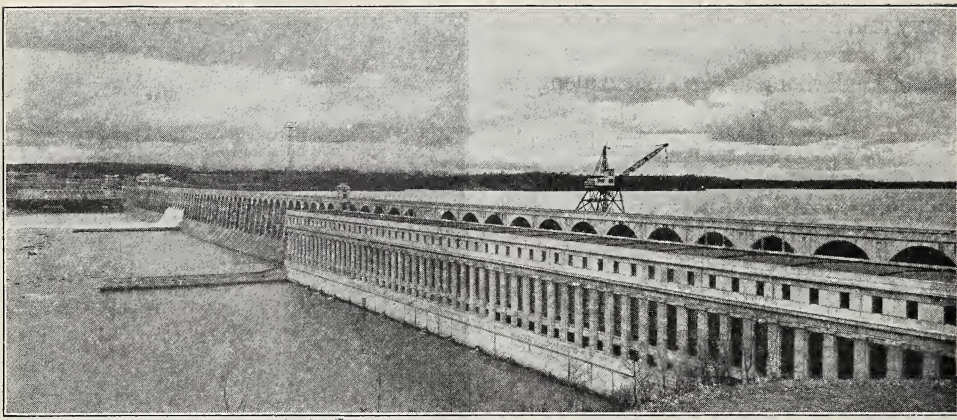

Fig. A. The Wilson Dam and water-power plant on the Tennessee River at Muscle Shoals, Alabama. Find Muscle Shoals in Figure 255 -A. Name some things that the electric current from this power station might do for man.

POWER AND MANUFACTURING

As you study this section, get ready to answer this question: Are the Southern States rich in resources for manufacturing?

The factory takes us to town. The number of people living in cities is increasing much more rapidly than is the number of people in the country. Why is this? One reason is that manufacturing is becoming more important in this age of science and machines. Every year we learn how to make new things, most of which are made in factories. Since your father was born, many things like the radio, the automobile, and the phonograph have been invented. What other inventions can the class add to this list? These and many other products are made in factories, and the factories are nearly always in towns or cities. The Southern States have a great variety of materials (*raw materials*) that can be used to make factory products. They also have an abundance of the things used to make power to run the factories. Therefore we say that the South is rich in resources for manufacturing.

Power — water power and machines. Before the age of science and machinery, our people spun cotton and wool into threads by using little wheels that the spinner ran with her foot. The thread was made into cloth on another machine that the weaver ran with the foot. Now all this is done by mechanical power instead of muscle power, and it happened in this way. Long ago men learned to catch the power of falling water and make this power turn wheels. We call it water power.

The Southern States are rich in water power, especially along the slopes of the Appalachian Mountains, where rivers, which have their sources three or four thousand feet above the ocean, fall over rocky ledges (Fig. 275-A) on their way to the sea.

Look at the map (Fig. 252-A). What is the elevation of the higher Appalachians? Now find the rainfall of this region for a year. Can you tell why the Southern States have a great deal of water power?

Power in the Tennessee Valley. Since 1933 the United States Government, through its *Tennessee Valley Authority*, has been trying to develop the water resources of the Tennessee Valley. Among other things the government is building a number

of dams to control floods and to improve navigation along the Tennessee River. Wheeler Dam, a few miles above Muscle Shoals, Alabama, and Norris Dam, near Knoxville, Tennessee, are to be in operation in 1936. Wilson Dam (Fig. 284-A) at Muscle Shoals has been producing electric power for some time.

The government plans to sell the surplus power produced at these dams to the towns, cities, and farms of the Tennessee Valley at very low rates. Hundreds of miles of power lines have already been built to serve the rural areas of this valley, and a great many towns and cities in Alabama, Mississippi, and Tennessee are already buying their electric power from these new sources at a great reduction in cost. What other states will also benefit from the Tennessee Valley power?

Near Columbia, South Carolina, is the Saluda Dam. Its power plant develops 200,000 horse power and is expected to make another 100,000 horse power in the near future.

The rise of the cotton mill. For a long time after Eli Whitney's cotton gin made it possible for cotton to become the chief crop of the South, most of the cotton was sent to other states and countries to be made into cloth. Shiploads of cotton went to Europe, and others to Boston, Providence, New York, and Philadelphia. Later the people in the Southern States began to build factories for making cotton cloth (Fig. 286-A). Their good supply of water power is one of the reasons why cotton manufacturing has grown so rapidly in the Southern States. Greensboro, North Carolina, has the largest denim (cotton cloth) mill in the world. North Carolina rivals Massachusetts in cotton manufacture and passes her some years, while South Carolina is not far behind.

Power — petroleum; striking oil. One day in 1925, a jack rabbit sat dozing under a bush on a treeless prairie in Texas, eighteen miles from a railroad. There was not a house in sight. Even the cattle that sometimes grazed there had not been near his bush for a week. The jack rabbit was much surprised when a man came along, looking, looking, looking — but the man was not looking for rabbits. The rabbit

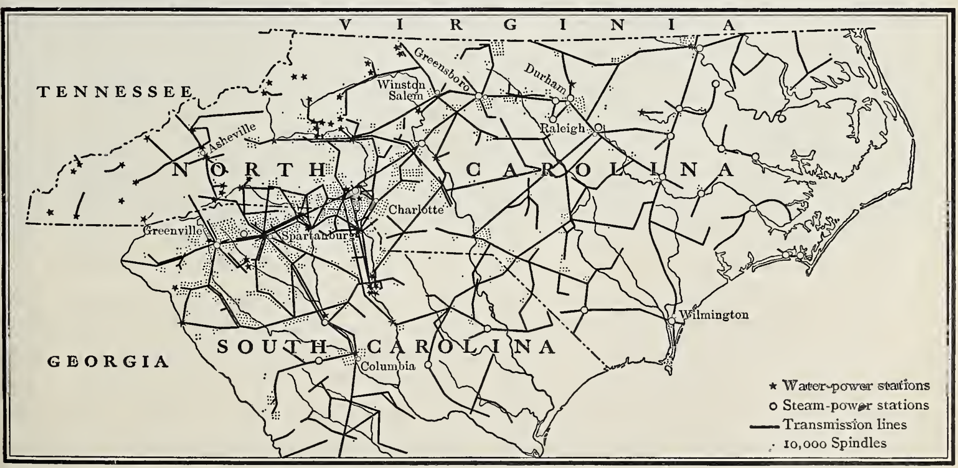

Fig. A. Spindles are used in the spinning of cotton into thread. Where there are spindles, there must be mills to house the spindles. Why are the cotton mills on this map near the water- and steam-power stations? What does the map tell you about manufacturing in these two states? What parts of North Carolina do not have water power?

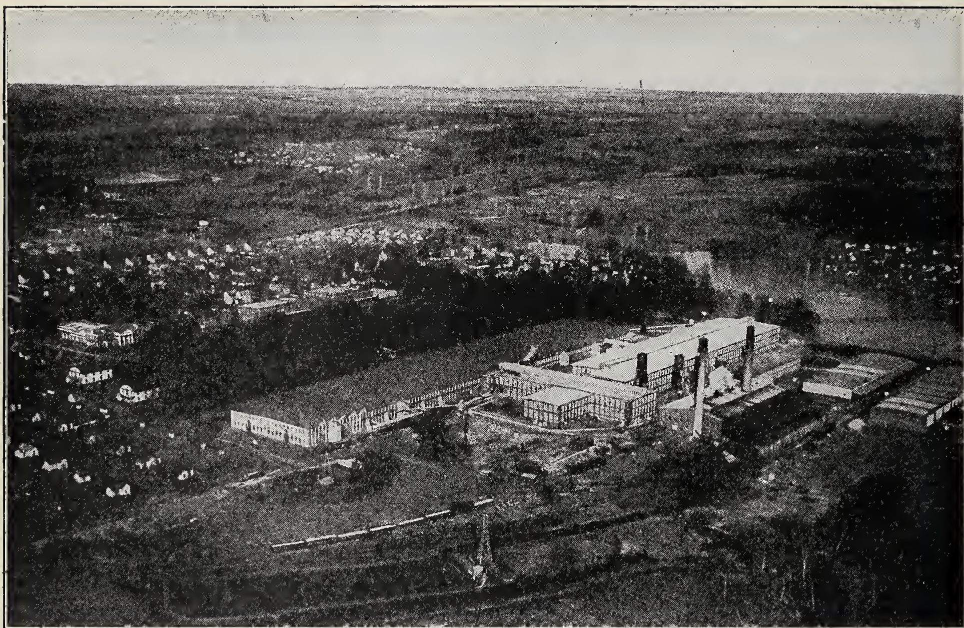

Fig. A. This big cotton mill is near Greensboro, North Carolina. It can manufacture 160,000 yards of denim a kind of cotton cloth, every working day. See the workmen's village near the mill.

did not know it, but the man was a *geologist* looking for signs of oil. From some things he saw, the geologist thought that there was oil under this cattle ranch.

The oil well. In a few days some trucks appeared in the jack rabbit's prairie. The trucks carried engines, gasoline, nails, bolts, lumber, and many other things. Automobiles carried carpenters, mechanics, and laborers. The men built a derrick (Fig. 287-A) to hold machinery for drilling holes in the earth. When everything was ready, the engine started, and the drills began to bore a hole into the ground. Down went the hole through clay and sand and rock. It went down for hundreds of feet. The men put steel pipe down the hole for a lining. One day, early in 1926, the drill came to a layer of porous sandstone full of natural gas. With a roar, the gas blew the heavy drill out of the well, much as the cork comes out of a pop bottle. There was some petroleum with the gas, and it flew up into the air and fell like rain. The men had "struck oil." Such a well is called a *gusher*. This happened so suddenly that all the well drillers could do was to run before the oil took fire from the engine that ran the drill. Sometimes, in oil fields, men are caught by fire and lose their lives.

The oil rush. In a few days hundreds of other men rushed there to build more derricks and dig more wells. They slept in automobiles, in trucks, in tents, and under pieces of canvas tied to automobiles. They worked furiously hauling food, lumber, pipe, coal, gasoline — everything needed to bore wells and build a town in which to live while they worked. In a few weeks that empty prairie, where the jack rabbit had lived, became a town of many tents and rough wooden houses. Stores, restaurants, garages, banks, and

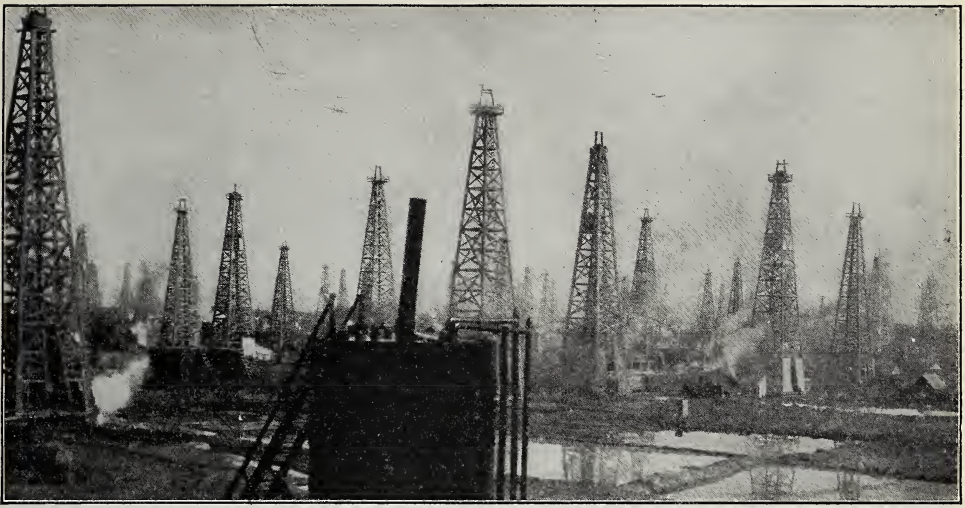

Fig. A. An oil field in Texas. Notice how close together the derricks are. Under each derrick is an oil well.

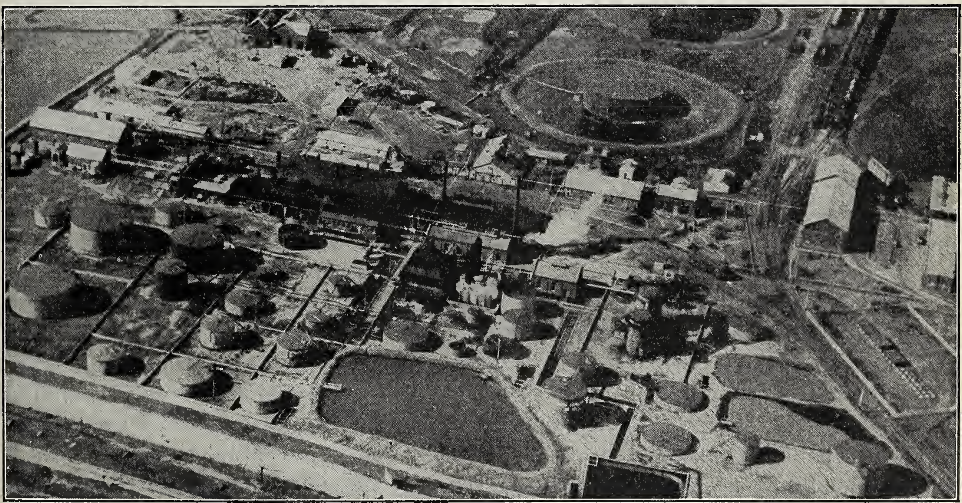

Fig. B. After the oil comes from the ground, it must be sent to a refinery such as you see in this picture. The refinery extracts gasoline and other products from the crude petroleum. This refinery is in Texas.

movie theaters soon followed. In October a school was opened, and late in 1927 the town had 20,000 people, with many children in the school.

Sometimes even water has to be hauled to supply the new oil town because the water there is oily. In one such town a barrel of petroleum sold for seventy cents and a barrel of water cost a dollar. In 1931 they got so much oil that it was worth only ten cents a barrel in some places, and much of it was wasted. They had dug too many wells. Texas and Oklahoma have many oil fields. In two years many empty places in those Southern States have become towns and have

Fig. A. Wheeling, West Virginia, as it looks from an airplane. This picture gives you a very good idea indeed of the Appalachian plateau country of West Virginia and Pennsylvania, with its vast supply of bituminous coal.

changed in population from a few cattle and jack rabbits to many thousands of people. A town in Texas had 400 people when the first well in the neighborhood yielded oil. Only a year later it had 40,000 people.

The oil industry moves. Sometimes oil towns are abandoned almost as quickly as they grow, for even the best oil well finally stops yielding.

The petroleum industry began in Pennsylvania in 1859. It spread to Ohio, Indiana, Illinois, West Virginia, and later to Texas and Oklahoma. In recent years, people have been finding one oil field after another in Mexico, Texas, Oklahoma, Louisiana, Arkansas, Kansas, and California. After each discovery of oil comes a rush of people. Beaumont, Texas, Tulsa, Oklahoma, and many other towns in those states have grown rapidly because of oil. Texas and Oklahoma now produce hundreds of millions of barrels of oil each year, and rival each other and California for first place.

When a new oil field starts, the oil is hauled away at first in tank trucks and in tank cars on the railways. If the field is a large one, lines of pipes are laid so that the oil can be pumped hundreds of miles away from the oil field to storage tanks in distant cities (Fig. 290-A).

Oil trade and oil products. Every week several big steamships, called *tankers*, sail out of the Gulf of Mexico filled with oil bound for Philadelphia, New York, and many foreign countries, such as England and France. When we see an automobile whizzing past, or an airplane roaring over-

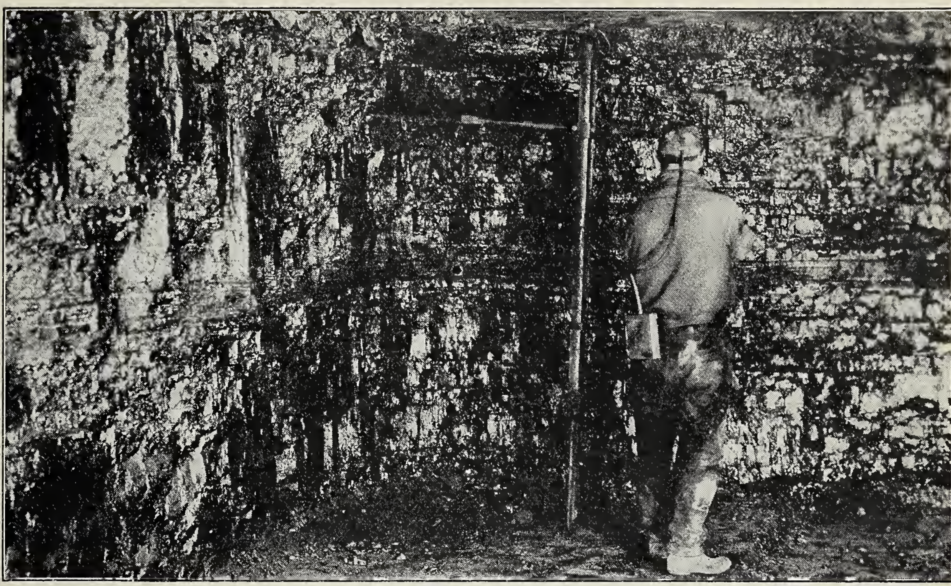

Fig. A. This seam of bituminous coal is thicker than the miner is tall.

head, or think of a submarine diving under the sea, we should think also of a tank steamship with its load of crude petroleum. From this thick, dark oil the refinery makes gasoline for automobiles and engines, oil for greasing machinery, vaseline, kerosene, medicines, tar, and many other useful things. It drives the tractors and harvesting machines which help to feed our own people and those of Europe, and also drives hundreds of locomotives and steamships, and heats thousands of houses.

Natural gas. Sometimes natural gas comes with the oil. It is the best fuel man knows, for it will burn with great heat. Sometimes it is carried in pipes to neighboring states to make light, to heat stoves, and to run engines. Enough good natural gas has been allowed to waste in the United States to heat every house in the country for years.

The oil and gas of the Southern States give splendid sources of power while these natural riches last.

Power — coal. The Southern States are rich in coal. The Appalachian plateau (Figs. 278-A and 288-A) is of great use in manufacturing, because so much good coal lies beneath its rocks. The rocks here lie flat, almost like the pages in the book that lies on your desk. There are layers of sandstone, layers of shale, and here and there between are layers of coal.

The Appalachian coal fields. These coal fields extend most of the way from northern Alabama through parts of Tennessee, Kentucky, West Virginia, Virginia, Pennsylvania and on to Ohio (Fig. 290-A). There are many coal mines in these states and also in Indiana and Illinois. There are hundreds of villages and towns where most of the workers are coal miners. When the miners go to work they climb into mine cars, and a small electric locomotive pulls the little train into a hole in the mountain side. Here the men work all day in darkness, except for the dim light of small lamps fastened in their caps.

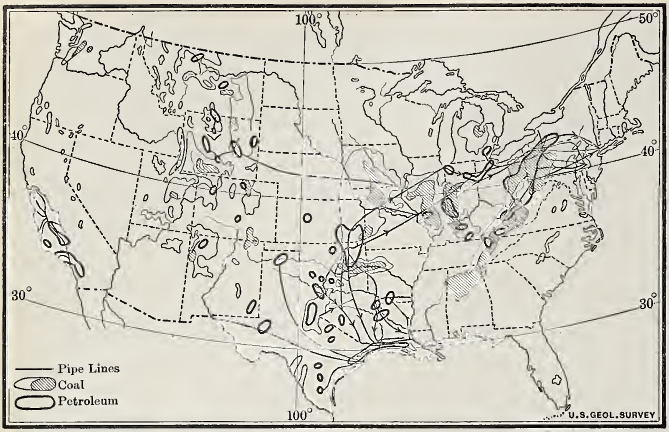

Fig. A. This map shows where coal and petroleum are found in the United States. Find states that have neither coal nor petroleum. Have they water power?

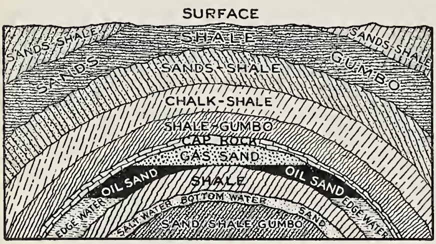

Fig. B. How oil and gas occur in the earth. Tell how you would get this oil and gas.

Mining coal is dangerous work. Rocks often fall from the roof of the mine and injure or kill the miner and his assistant. Sometimes gases in the mine explode like dynamite and kill dozens of men. We should all be grateful to coal miners, for they bring us the fuel that heats homes and runs engines.

The Southern States have far more coal than South America, Africa, and Australia. It is a great resource for manufacturing. They also have many other minerals useful in manufacturing.

A problem in arithmetic. One electric horse power has as much strength as seven men. When Muscle Shoals power plant is completed and running to capacity it will produce 612,000 horse power. How much man power is this? How does this number of men compare with the total population of your state?

Building a power map. Make a new outline map of the United States.

1. Put on it in black the areas in the Southern States that have coal.
2. Put on it the name and location of New York, Philadelphia, Chicago, New Orleans, Port Arthur (Texas). Put on it some important oil pipe lines.
3. Show by some means the area that is over 1,000 feet above the sea.

Stories to tell. Here are some stories for you to tell:

1. Making cloth old style; new style.
2. Climate and the cost of living.
3. Oil: how we get it; how we carry it; what it does for us.
4. Story of an oil town.
5. Story of a coal miner's day.

Using words. Use each of the following words correctly in sentences:

1. gusher
2. geologist
3. derricks
4. pipe lines
5. struck oil
6. drill
7. oil town
8. tankers
9. mechanical power
10. muscle power

MINERALS AND MANUFACTURING

Coal and iron, the factory twins. Coal and iron work together like twins. Engines and machinery are made of iron (or steel, which is a form of iron) and are run by coal. Coal turns water to steam in the boiler of the engine. Steam drives the engine; the engine runs the machinery which does the work of the factory. Man stops, starts, and greases the machinery. He feeds it and takes away what the machine makes. You can scarcely think of a thing that was not made by machinery, from your lead pencil and your pocket-knife to the shoes on your feet, the boards in the floor, the locomotive, or the automobile that carries you about the country.

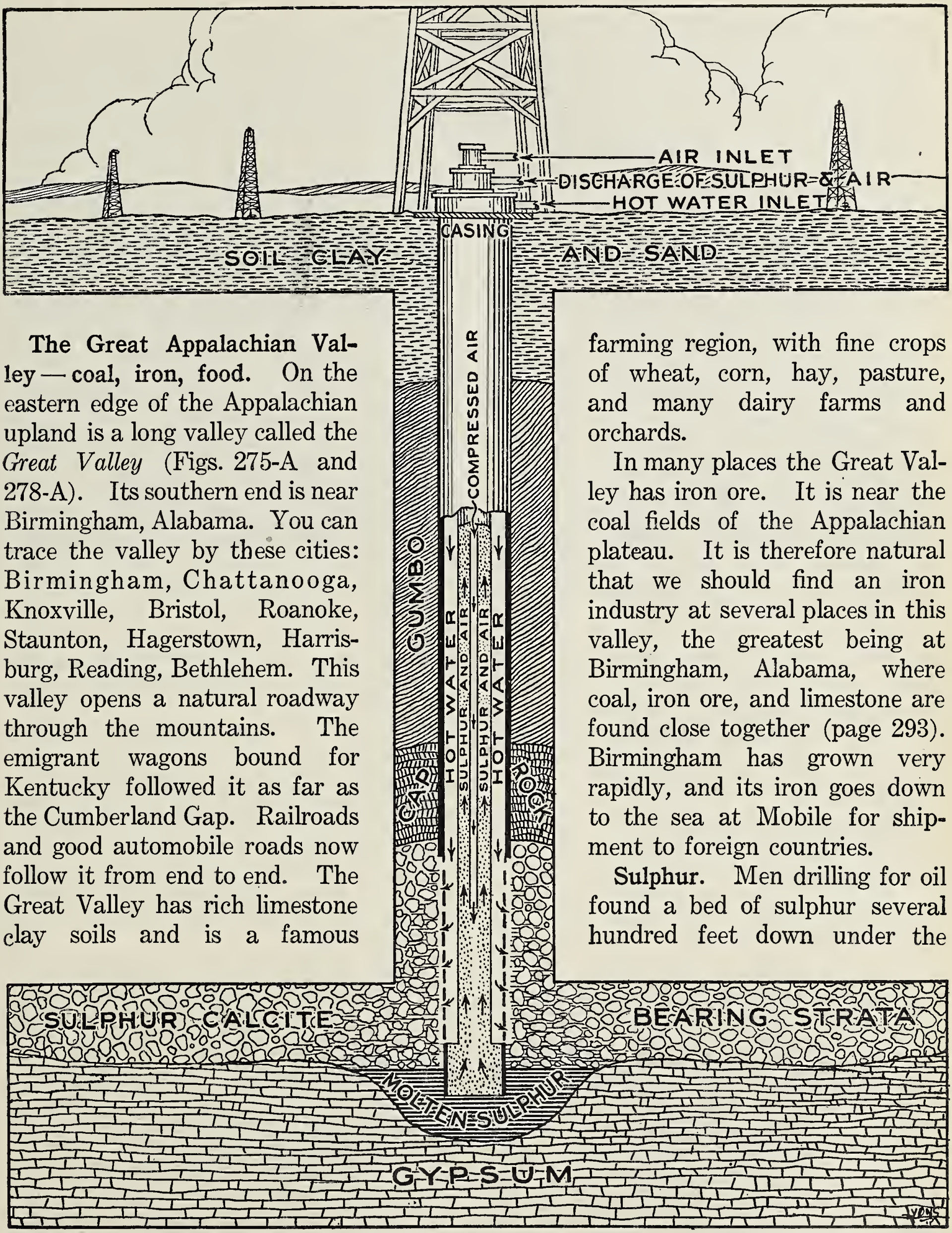

Fig. A. Hot water melts the sulphur, after which it runs like molasses. Air forced down the small central pipe pushes the melted sulphur up the larger pipe to the surface. After the hot-water heater and the air pump start working, the sulphur runs out in a steady stream. It soon cools and hardens. It will keep for years, ready to be used at any time. In no other country can man get sulphur so easily.

The Great Appalachian Valley — coal, iron, food. On the eastern edge of the Appalachian upland is a long valley called the *Great Valley* (Figs. 275-A and 278-A). Its southern end is near Birmingham, Alabama. You can trace the valley by these cities: Birmingham, Chattanooga, Knoxville, Bristol, Roanoke, Staunton, Hagerstown, Harrisburg, Reading, Bethlehem. This valley opens a natural roadway through the mountains. The emigrant wagons bound for Kentucky followed it as far as the Cumberland Gap. Railroads and good automobile roads now follow it from end to end. The Great Valley has rich limestone clay soils and is a famous farming region, with fine crops of wheat, corn, hay, pasture, and many dairy farms and orchards.

In many places the Great Valley has iron ore. It is near the coal fields of the Appalachian plateau. It is therefore natural that we should find an iron industry at several places in this valley, the greatest being at Birmingham, Alabama, where coal, iron ore, and limestone are found close together (page 293). Birmingham has grown very rapidly, and its iron goes down to the sea at Mobile for shipment to foreign countries.

Sulphur. Men drilling for oil found a bed of sulphur several hundred feet down under the

mud of the coastal plain of Louisiana. In some places this bed of sulphur is 100 feet thick. Volcanoes make beds of sulphur. This volcano had worked and died so long ago that it was covered with hundreds of feet of mud, but we have found a way to get this sulphur without going down after it (Fig. 291-A), and now Texas produces more sulphur than any foreign country.

Some men were once digging a well in southern Louisiana. Beneath the soft mud and clay they found hard, white rock salt, a solid mass of it, hundreds of feet thick. There are twenty-five of these masses in Louisiana, with fifty thousand million tons — enough to last the United States a long time.

Bauxite, lead, and zinc. Arkansas furnishes a fifth of the world's supply of the mineral called *bauxite* (pronounced bō′zīt), and all that is produced in the United States. There is much aluminum in common clay banks, but it is much easier obtained from bauxite. The Ozark Plateau and Mountains have mines yielding lead and zinc; Missouri producing more lead than any other state in the United States.

Phosphate rock and marble. The South produces phosphorus, the most important raw material for the fertilizer industry. Large areas of the South have sandy soil that will not yield good crops without fertilizer, and phosphorus is the most important of all the commercial fertilizers. The Southern States are lucky indeed to have this important phosphorus at two places within their own borders. Some is mined in Tennessee, but nearly five times as much is mined in Florida. *Lime phosphate* is the name we give to this rock made from the bones and droppings of animals that lived long ago. A poor gravel bank may have a quarter of its bulk made of pebbles of lime phosphate.

Dozens of steam shovels are scooping up the banks in Florida gravel pits. Hundreds of men are busy with sand sifters and other machines, getting the phosphate pebbles from the sand. With locomotives, freight cars, and trucks, they are hauling phosphate rock to the port cities. Each year hundreds of shiploads of this valuable stone leave Tampa, Boca Grande, Fernandina, and other Florida ports, for ports on the Atlantic coast, for Europe and other foreign lands. The state of South Carolina alone buys from Florida about 200,000 tons of phosphate rock a year.

Very beautiful marble, suitable for fine buildings, is quarried near Knoxville, Tennessee, and also in Georgia, and sent to many distant places.

Raw materials. Make a list of raw materials that can be found in the Southern States, and tell a use for each.

Giving reasons. Give four reasons why the Southern States have important manufactures: 1, a food reason; 2, a raw-material reason; 3, a power reason; and 4, a living-cost reason.

Short talks. Prepare a short talk about each of the following:

1. Iron materials and Birmingham.
2. The story of a lump of Louisiana salt; of Texas sulphur; of an aluminum cup.
3. A ship sailing from Tampa.
4. Pretend that an uncle had left you some land with lime phosphate in it. Make a plan whereby the land might pay your way through college.

Completing sentences. Complete each of the following sentences:

1. On the eastern edge of the Appalachian plateau there is a long .... called the Great Valley.
2. Its southern end is at ...., Alabama.
3. This valley opens a natural .... through the mountains.
4. Railroads and good automobile .... follow it from end to end.
5. It is a .... farming region.
6. In many places in the Great Valley there is .... ore.
7. Birmingham iron goes down to sea at .... for shipment.

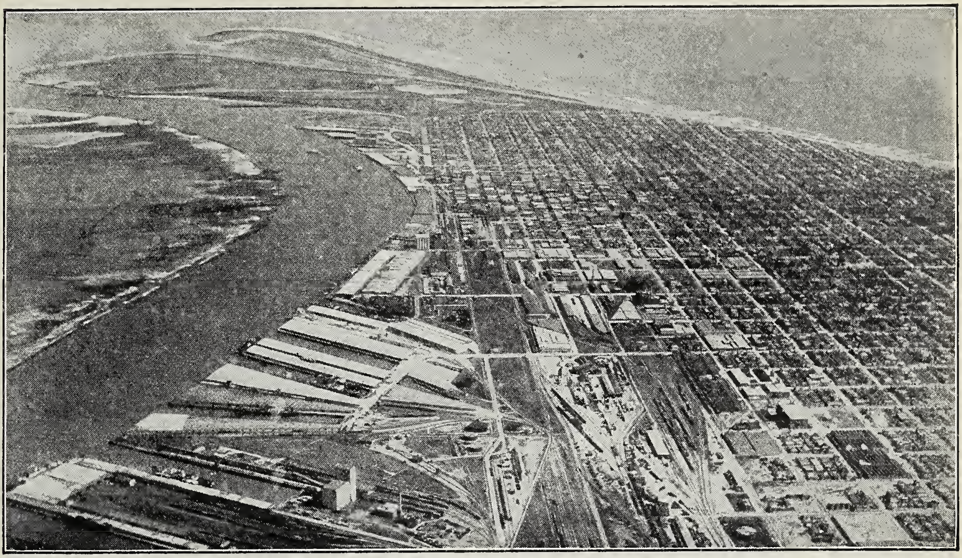

Fig. A. A part of the city and harbor of Galveston. The waters of the Gulf of Mexico are seen in the distance Galveston is the world's largest cotton- and sulphur-shipping port. Find ships in the docks by the large piers.

POPULATION AND CITIES

Population. Examine Appendix (page A-11). It will tell you how many of the twenty largest cities of the United States are in the Southern States. Most of the people of the Southern States are engaged in farming or lumbering, and these industries do not need many people to a square mile. As the population is scant, much of the country is still in forest; and many a boy visits his string of rabbit traps on crisp autumn mornings as he goes across the fields and through the woods from his farm home to the country school.

In Oklahoma there are many Indians, for this state was once set apart as a home for the Indians, and before 1890 no white men could own land there. Since 1890 white men have gone to Oklahoma in great numbers and have built trade centers, such as Tulsa and Oklahoma City.

Many of the people in some parts of the Southern States are Negroes. The Negroes were brought here to work in the cotton fields, and most of them live in the Cotton Belt today. In some sections there are more Negroes than white people.

What makes cities? A city is a place where a great many people live, but what is it that makes a great many people live in this one place? The best answer is one short word: *jobs.* We live where we can get a job, and we get jobs at places where business can be carried on. Therefore cities grow at places that are good for carrying on business. Look at Birmingham, Alabama. We found (page 291) that near Birmingham are coal, iron, and limestone, the three things needed to make iron. Therefore thousands of men who work in the iron industry live near one another. Since Birmingham has *many* ironworkers, there will also be many people there with other kinds of jobs. Storekeepers, postmasters, and letter carriers will be there to help the ironworkers carry

Fig. A. Airplane view of part of the harbor and business section of Baltimore. Near what bay is this fall-line city? (Fig. 252-A.) How has the bay helped the city to become one of the world's great ports?

on their business more easily. How many others can you name?

Four groups of cities. The raw materials and industries of the Southern States have helped to make four groups of cities.

Group 1. The port cities. These are the cities to which ocean steamers go, carrying away export goods and bringing back import goods.

In every one of these cities there are wharves and warehouses where carloads of freight from the interior must be unloaded and stored until there is enough to fill the ocean steamers. Thousands of men find work handling freight in port cities.

Galveston is a great port for the shipment of cotton from Oklahoma and Texas, and wheat from Kansas and Colorado. Recently a ship channel has been built to Houston. Since large vessels can go on the canal, Houston has now become an important seaport. Port Arthur, with the pipe lines from the near-by oil fields, fills many tank steamers for the refineries of Philadelphia, New York, and Europe.

New Orleans is the great southern gateway to the country. Freight from the hot lands of Central America reaches Chicago and many other interior cities most quickly by way of New Orleans. Therefore New Orleans imports more bananas than any other city in the world. It ships great quantities of cotton and lumber and is the port for a large territory.

Mobile, Tampa, Charleston, Savannah, Wilmington (**N. C.**). These cities are also lumber and cotton ports, and Mobile ships great quantities of iron and steel made in Birmingham. Tampa is the greatest phosphate port in America, and Savannah is the greatest port in the world for the

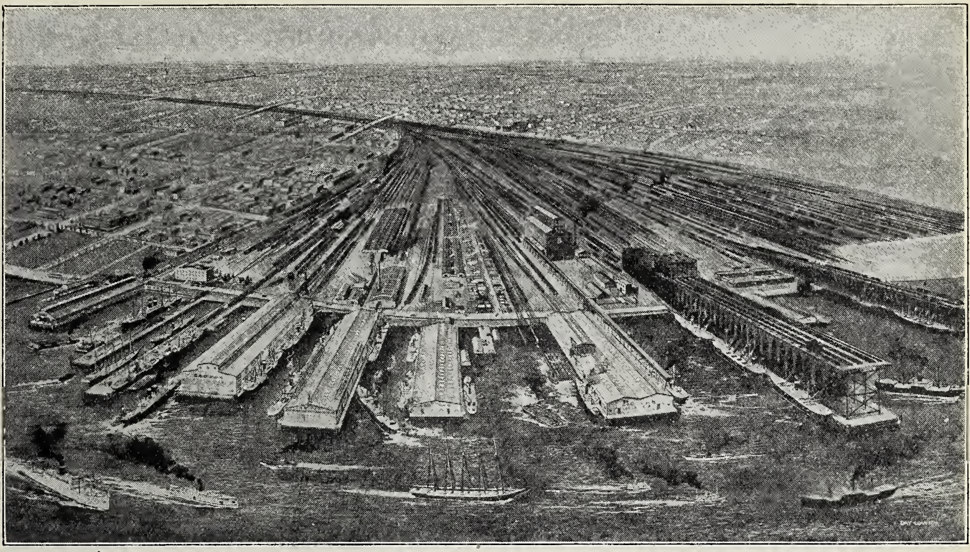

Fig. A. This picture was taken at Newport News, near Norfolk, Virginia (Fig. 252-A). At the right of the picture are coal piers. Coal cars are run on to the piers, the bottoms of the cars open, and the coal falls through chutes into the boats below. In the center of the picture are four covered piers. Beside the piers are ocean-going ships. Inside the piers are railroad tracks on which freight cars are standing. Goods can be brought from any part of our country and loaded directly from car to ship at this terminal.

shipment of resin and turpentine. These things, which we call *naval stores,* are made from the sap of pine trees (Fig. 282-A) that grow on the sandy soils of the South.

Norfolk is the great port for the lands that produce tobacco and peanuts. The mouth of the James River, wide and deep, is called Hampton Roads. It is one of the finest natural harbors in the world and the leading coal-shipping port in America. Name three cities on its shores (Fig. 252-A).

Baltimore is one of the leading ports of the United States. It has many kinds of manufacturing, for you can easily see that if a place is good for a port it will also be good for factories. The ocean ships, the river boats, the railroads can bring in raw materials, and they can also carry produce away to other markets. Baltimore has a greater variety of manufactures than any other city in these states. She is second only to Birmingham in iron and steel. The ore comes in ships from Cuba and Chile and even from Europe, and the fuel from the coal mines in the Appalachian plateau. Oysters, which are gathered from the bottom of the shallow waters in Chesapeake Bay, are also canned at Baltimore.

Wilmington, Delaware. This city is the northernmost port of the Southern States. It has many factories which manufacture machinery and railroad cars. Very fine boats are also built here. This city is the headquarters of a company that makes more dynamite and other explosives than any other company in the world. The factories are built in lonely places along the Delaware River and elsewhere; so that if the explosives blow up, they cannot do much damage.

The fertilizer industry. In every large port city of the Southern States there are factories for the manufacture of fertilizer tc be used on the near-by farm lands. The

Fig. A. Looking down Central Avenue, Hot Springs, Arkansas. The forested mountain country about Hot Springs is a part of Hot Springs National Park. Hot Springs may be classed as another kind of city — a *health-resort* city. Why?

materials from which fertilizer is made are heavy, and the port is the best place to bring them together by ship — Texas sulphur comes from Galveston, bones from the Argentine Republic in South America, nitrate of soda from Chile, shiploads of potash from Germany, fish meal from the near-by ocean, and phosphate rock from Florida.

Fertilizer from the air. Recently, a new way of making fertilizer has been found. Nitrogen, the most costly of the plant foods, makes up three fourths of the air, and men have learned how to take nitrogen from the air and put it into such form that plants can eat it. A single nitrogen factory in Virginia cost a hundred million dollars. It is located at Hopewell, on the lower James River, where ocean steamers can load and unload beside the factory. It can make many thousand tons annually of valuable material having in it the nitrogen that came in through the window.

Something to explain. Give several reasons to complete the following:

1. "I am a city because ...."
2. "I am a port city because ...."
3. "I am the .... industry. I am in every large southern port city because ...."

Two city teams. Name two teams. Each member says, "I am (name of a city). I .... (tell about yourself)." The team that tells the most things correctly wins.

Port cities. 1. Tell what a port city is. Have you visited one? Point to it on the map.

2. Write a sentence to explain the words *export* and *import*. Remember the meaning.
3. Describe a busy port.
4. Find Galveston on your map. What are the main exports going through this port?
5. Look at the picture of Galveston on page 293. Notice how the city is laid out.
6. Find Houston. What has enabled it to become a port? Name some famous canals.
7. Name the products sent out from Port Arthur. What cities receive these?
8. What is New Orleans popularly called? Why? On what large river is it located?

MORE KINDS OF CITIES

Group 2. The cities on the Ohio and the Mississippi. You will now learn something about river cities. Boats may go up and down the Mississippi River from New Orleans to Pittsburgh, Minneapolis, and Kansas City. They can carry freight more cheaply than can the railroads. Now suppose a man wishes to build a new factory. He is examining two towns. One is an inland town where boats cannot go. It has three railroads. The other town is on a river. It also has three railroads and river boats which carry some kinds of heavy freight more cheaply than do railroads. In which place would you advise the manufacturer to build his factory if it uses much heavy material? Perhaps you will get an answer if you look up in the Appendix the population figures for a number of cities on the Ohio and Mississippi rivers, and for the same number of inland cities which are in states touched by these rivers.

Boats also go up and down a branch of the Ohio to Charleston, W. Va. This city shares with Wheeling and Parkersburg, W. Va., the advantages of boats and nearness to the coal fields, and factories making articles of iron and steel. Louisville, Kentucky, has many kinds of factories. Memphis is a great commercial center. It handles more cotton than any city in the world that is not a seaport. What reasons can you find for this trade (Fig. 256-A)? The cottonseed factories of Memphis make dozens of different products from the little black cottonseeds. You have already learned about the lumber business of Memphis (page 283). Every year many boatloads of steel from Pittsburgh and other upstream cities are unloaded from boats, put upon cars, hundreds of them, and sent in all directions. Shreveport, Louisiana, with its oil refineries, and Little Rock, Arkansas, with its wholesale stores, have the advantage of river-boat service. Little Rock got its name because it is located on the smaller of two bluffs—called Little Rock Bluff—on the Arkansas River.

Group 3. The Great Valley cities. In the section on iron (page 291) we learned something about the Great Valley and its cities. A railroad follows this valley from end to end, and there is a town at every point where a railroad crosses the valley from the Piedmont into the plateau. Many of these valley cities have cement mills using coal from the plateau, and clay and limestone from the valley floor. There are also many woodworking plants using wood from the Appalachian Highlands, which are in sight from the plants' windows. The railroads bring cotton and there are cotton mills in many of the towns of the Great Valley. In several of the towns of Tennessee and Virginia large factories have been built to make rayon, or artificial silk, for which cotton is one of the chief raw materials.

Group 4. Cities of the fall line and interior. **The fall line.** If you go up the Potomac River or the James or other streams in the Atlantic Coastal Plain, you will pass miles and miles of river bank made of sand and clay, but you will see no stones or rocks. The water here is quiet and deep. At last your boat will be stopped by a waterfall at a place where the river tumbles down over rocks. Why are falls in the rivers? As the rivers flow toward the sea, they flow over the solid rock of the Piedmont, which happens here to lie near the surface. When the rivers reach the coastal plain, they flow across the soft earth of which the coastal plain is made, and the water easily cuts channels in the softer soil. The channel gets deeper suddenly as the rivers plunge from

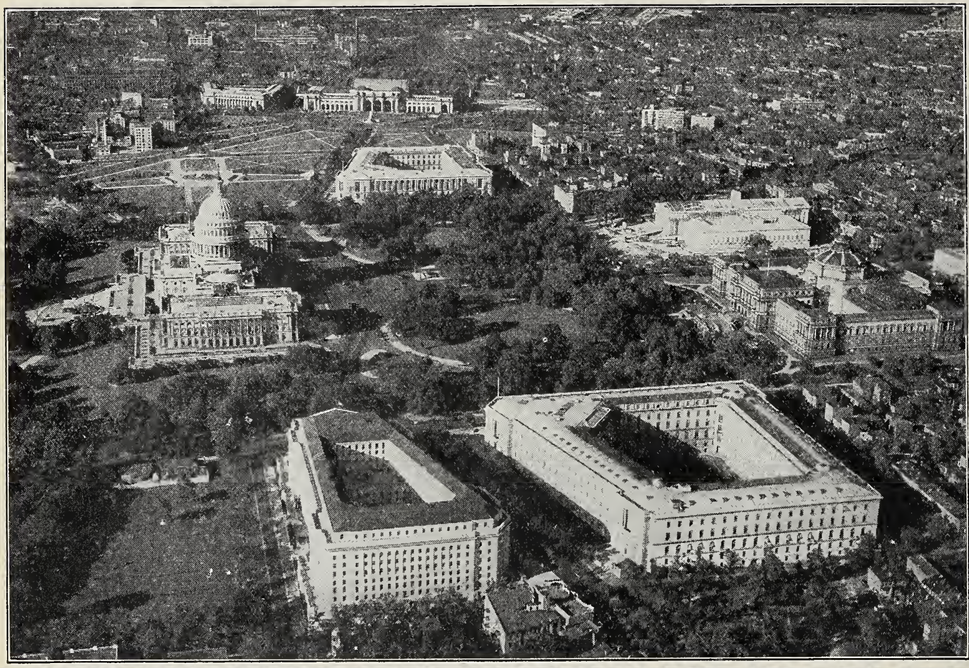

Fig. A. Air view of a part of Washington, D. C. Find the Capitol and the Union Station. In front of the Capitol is the Library of Congress. Office buildings for senators and representatives are on either side of the Capitol.

the hard rock at the edge of the Piedmont on to the soft soil of the plain. There is a waterfall at this place in every river of the Atlantic slope. If you imagine that a line is drawn to connect these waterfalls, you may call the line the *fall line.*

The fall-line cities. Boats of the early settlers going up rivers could not pass the falls. Therefore the boats stopped and were unloaded. A town naturally grew up at this unloading point — a trading place.

Why do the falls help to make an *industrial* town on almost every large stream that passes from the Piedmont into the coastal plain (Fig. 275-A)? Find the following fall-line towns on the maps (Figs. 252-A, 278-A), and trace the line that connects them. Trenton stands at the fall line on the Delaware. Philadelphia marks the point where the first rapids appear in the Schuylkill River. Wilmington is situated at the rapids of the Brandywine, a branch of the Delaware. Baltimore lies where a creek called Jones' Falls tumbles into Chesapeake Bay. Washington is at the rapids of the Potomac. Fredericksburg, Virginia, on the Rappahannock, Richmond and Raleigh, capitals of two states, and the Cotton Belt cities of Columbia, Augusta, Macon, and Columbus (Georgia) are also fall-line cities.

Washington is not in any state. It is in the District of Columbia, which has an area of only seventy square miles. How large is your state? Congress governs the District, and its people do not vote for President.

How does the population of Washington compare with that of the largest cities of

Fig. A. A part of the downtown business section of San Antonio, Texas. Find something about the *Alamo*, an old Catholic mission building in San Antonio.

the Southern States? It has very little manufacturing or trade. Its great industry is government. The President of the United States lives there during his term of office, and the members of Congress reside there when Congress is in session.

In the beautiful Capitol building, the senators and representatives from all the states meet to make the laws for the entire United States. These senators and representatives together make up the Congress of the United States. Thousands of men and women in Washington are busy running typewriters, making postage stamps and paper money, counting money, making government maps, and printing government books.

The capital city has many beautiful public buildings which belong to all the people. Many travelers go there to see them. The city was named for George Washington, the first President of the United States. His beautiful old home at Mount Vernon, on the bank of the Potomac near Washington, is a house dear to every American.

Inland cities. We have already studied about the water-power district of North Carolina (pages 284, 285). Here are Durham, Winston-Salem, Charlotte, Greensboro, and other manufacturing cities.

Atlanta, Georgia. This city is the largest of the many inland towns of the South. Many railroads center here, and many wholesale stores supply the retail stores in the villages, towns, and small cities of the country for many miles around.

Dallas, Fort Worth, and San Antonio. The two rival cities of Texas, Dallas and Fort Worth, are both trade centers for the vast area of cotton and cattle land in central and western Texas. San Antonio, the metropolis of southwestern Texas, is a winter resort because of its bright, pleasant, sunny weather that is just cool enough to make one enjoy being out of doors.

An easy way to learn. Copy and fill in the following outline about the cities of the Southern States. Compare your outline with those of your classmates, and see whose is most complete.

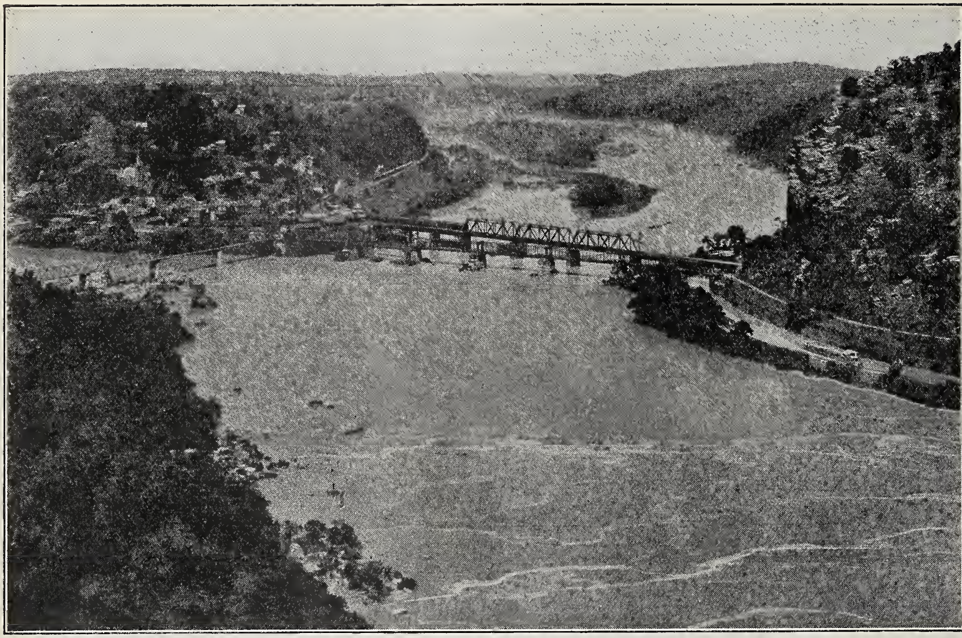

Fig. A. The Potomac River at Harper's Ferry. Notice that the railroads and the canal follow along the gap which the river has cut in the Blue Ridge. Point to the Shenandoah River. It drains that part of the Great Valley called the *Shenandoah Valley.* The high parts at the right and left are the sides of the gap.

Kinds of Cities	Cities	Jobs	Products Handled
1.			
2.			
3.			
4.			

A map game. On a blank map of the Southern States, place dots and initials for the cities named in this lesson. Exchange papers with a classmate, and see if he can guess the cities on your map.

A string of beads. The railroad along the Great Valley from Birmingham is the string. Cities are the beads. Use a line, round dots, and write the names of the cities.

Lists to make. Jobs that are done in a city because it is a railroad center; a capital.

A problem. Are the manufacturers of watches or cash registers or auto tires or steel rails equally interested in freight boats? Explain.

THE FUTURE OF THE SOUTHERN STATES

A rich land. The Southern States have great unused resources and plenty of materials for prosperity. They might easily support many more people than now live in that part of our country. China has six or seven times as many people in the same amount of land, and China is not so rich in natural resources.

The complete resources of the Southern States. No other important part of the world produces so large a part of the things necessary to the life of man, and so many things that man wants. This group of states is far ahead of the rest of the United States in the *number of crops* that it can grow. Bread and meat, milk and butter, fruits and vegetables — all these can be had in great abundance.

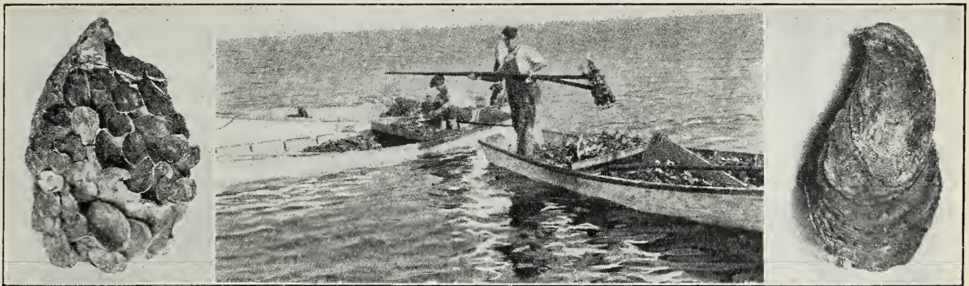

Fig. A. At the left is a crop of young oysters growing on an old oyster shell; at the right is a full-grown oyster in its shell. In the center the men are lifting the oysters from the shallow waters into the boats.

The Southern States can grow all that the people need of every important crop that grows in the North except wheat, and there is a fine wheat region in Oklahoma and in the northern part of Texas. The Southern States also grow cotton, oranges, grapefruit, and other crops that cannot be grown in the North. The people of Virginia supply more of their own needs from the produce of their state than do the people of any other state.

Lack of famines. Every continent except Europe has droughts that are much worse than those we have in the United States. Drought causes crop failures, hungry people, and famine. The rainfall of the Southern States is one of the best and most dependable in the world. Therefore, by using scientific agriculture, the people of these states can have one of the very best food supplies in the entire world *because they can depend upon their climate every year*.

Much unused land. Truck crops can be made to grow on land that is now idle. There could be several times as many apple orchards if the demand for apples were greater. The cotton fields could be enlarged and made to yield more by better crop rotation and better fertilization. There are large amounts of swamp land that could be drained for fields and crops. You saw (page 270) how the Mississippi flood lands might support as many people as live in one or two small European countries. There are hundreds of millions of tons of coal in the mountains, and with care the forest lands might yield great quantities of wood for as long a time as men took care of the trees.

Fish resources. Most of the coast of the Southern States is like that at Atlantic City, New Jersey, a beach with a bay behind it. These bays are rich with fish and oysters, and Biloxi, Mississippi, is the chief center for oyster canning in the United States. With care, the bays might yield more oysters, and the rivers and ocean more fish. The people of Maryland, Virginia, Delaware, and New Jersey have for many years taken oysters from their bays. (What bays?) The oysters in these bays have not been given a chance to grow; so the present yield is not so great as it once was.

It depends on man. We already know the long list of resources for power (pages 284-285) and manufacturing. Nature has done her part well. The future rests with the people.

Man is slowly learning how better to use the resources of the land on which he lives. That provisions for the future are being made in the Southern States can be shown by the story of two new tree crops, controlled agriculture, and other developments.

Fig. A. Point in these pictures to a large pecan tree; a pecan nut; a pecan kernel. After you have read the paragraph, *Taming the pecan*, explain the *graft* shown at the left side of the picture.

Taming the pecan. In the American forests are more kinds of wild nuts than grow in the forests of Europe or Asia. We have hickory nuts, walnuts, butternuts, pecans, beechnuts, hazelnuts, pine nuts, acorns. The pecan is a fine nut that grows wild along the Mississippi River and many of its branches, from Cincinnati, Ohio, and the southeastern parts of Iowa, Kansas, and Oklahoma, to the Gulf of Mexico. Most of these wild trees yield nuts with shells so shaped that you can get the kernel from its shell only after tearing the kernel to pieces. Here and there a tree bears nuts so shaped that the kernel will come out as shown in Figure 302-A. A few years ago men learned how to graft and bud the pecans and other nut trees, as they have been doing for centuries with apples, pears, peaches, and cherries. To do this you take a twig from a tree bearing excellent nuts, stick it into the branch of a tree that bears worthless nuts, and the twig from the good tree will grow and make a new top which will yield nuts just like the tree from which the twig came. If you find one splendid pecan tree and you wish to grow a thousand or a hundred thousand exactly like it, you can do so by budding or grafting. Already there are large pecan orchards in Texas, Louisiana, Mississippi, Alabama, Florida, Georgia — especially in Texas and Georgia — and the fine large nuts that grow on these trees can be bought in most towns.

Tung oil. We now spend millions of dollars each year buying from China the oil of the tung tree nut to make very fine varnish for airplanes and automobiles. We have learned that the tung tree grows and bears well in the Southern States and large orchards have been planted in southern Mississippi, Florida, Louisiana, Georgia, Alabama, and Texas.

The making of a new tree crop from *one* wild tree shows that we might make many more new crops from many more wild trees. Some day we may have a tree-crop agriculture and plant our hillsides to fruitful trees which hold the soil with their roots. Now we plow our hillsides

for crops. Water washes away the loose earth (Fig. 370-A), and our fields are often destroyed while we are trying to grow corn, cotton, and tobacco.

Controlled agriculture. During some years of the great business depression, which began in 1929, many farmers had to leave their crops unharvested. There was so much cotton, wheat, and certain other farm products on the market that many farmers could not get enough for their crops to pay expenses. Wise farm and business leaders began to see that in the future some form of controlled agriculture would be necessary so that farm crops could be sold at a profit to the farmer. In 1933, the United States Government adopted a temporary plan to limit the amount produced of certain crops such as cotton, wheat, rice, sugar, and tobacco. Is that plan still in operation?

If a system of controlled agriculture can be worked out in the future, it will be a good thing for farmers of the Southern States as well as for the entire nation.

Other developments. In addition to developing power resources, the *Tennessee Valley Authority* (pages 284–285) is also carrying on a great deal of other work which is very important to the future of the Southern States. In many parts of the country soil-erosion control has been carried on to keep the rich top soil from washing away and to keep the reservoirs formed by the dams from being filled with silt. Millions of trees have been planted by CCC workers (page 342) to re-forest land from which the original trees have been cut. Attempts are also being made at Muscle Shoals, Alabama, to produce low-cost fertilizers, such as phosphate, so that farmers can enrich their lands with the foods needed by growing plants. All of these developments in the Tennessee Valley are being watched carefully by the rest of the nation, for they may be of great importance to the future of the country.

The main question. What is your answer to the question with which this chapter begins? Write the answer in your notebook.

Tell a story. Tell one of the following stories about:

1. Ways man can easily make living easier and more comfortable.
2. Gullies and our future farms.
3. A million trees all alike.
4. Tree-crop agriculture.
5. Fresh vegetables in market before and after railroads came.
6. A speech: "Where I grow and why," by Mr. Orange and Mr. Lettuce.
7. A journey of a man who *liked* to dig potatoes and did it all the time he could get a job. How many months during the year might he work, and when would he begin digging potatoes?
8. Four-footed workers on southern farms.

Going to the store. Make a list of the things from the Southern States which you might buy in your neighborhood.

A definition and something to prove. What is meant by saying the Southern States have complete resources for manufacturing? Prove that they have them or do not have them.

Naming cities. Name the cities that have grown because of each of the following reasons. You should be able to name three or more cities for each cause.

1. Because they are on the seacoast and can export.
2. Because they are on railroads through the Great Valley.
3. Because they can use rivers to carry goods.
4. Because products from surrounding lands are brought together there.
5. Because boats can go only a certain distance, and so must unload.
6. Because waterfalls give power to factories.

Cotton Belt. 1. Why is the Cotton Belt in a part of Tennessee and not in all of it? Same for Oklahoma, Texas, Arkansas, North Carolina.

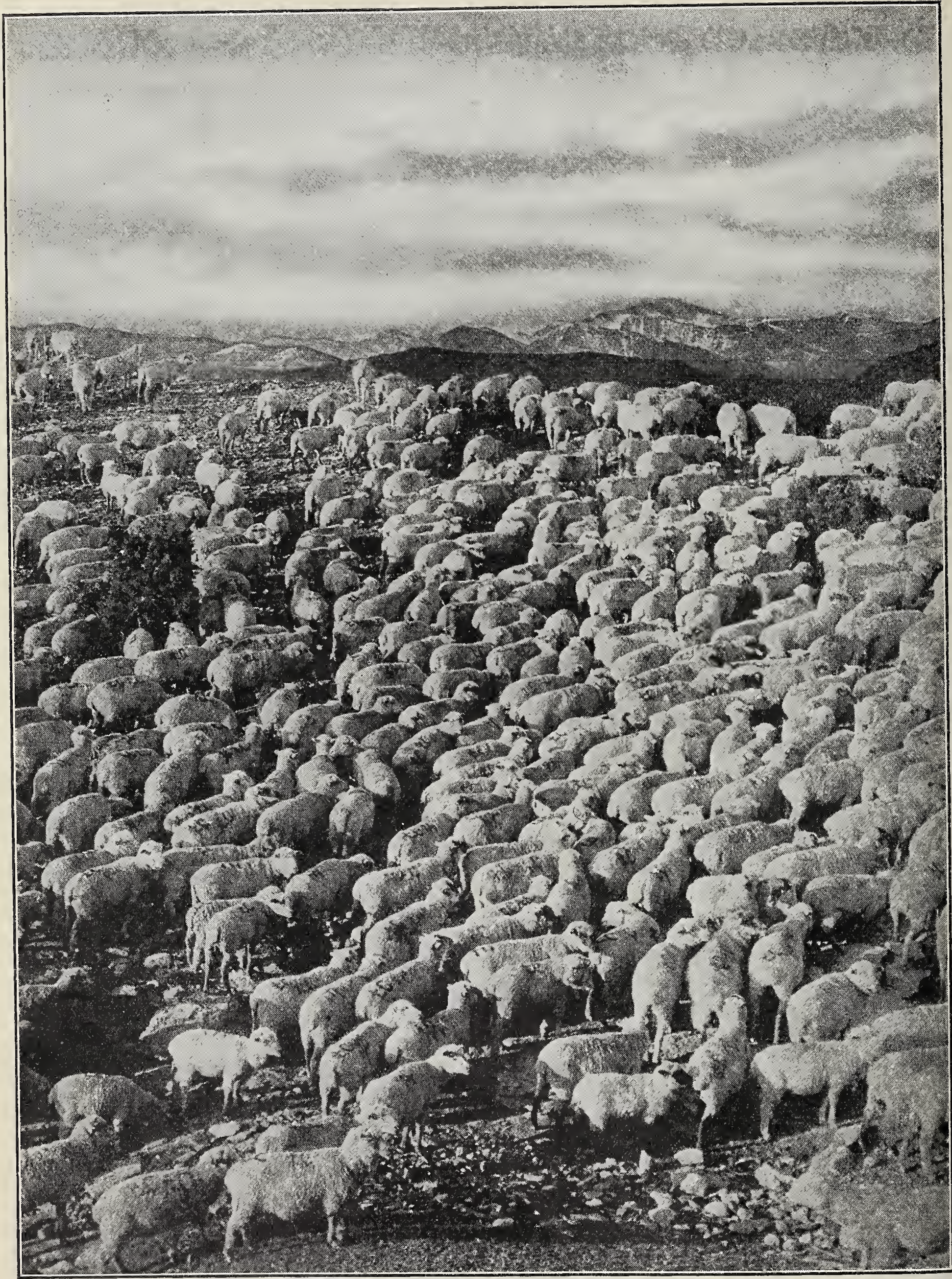

Fig. A. After you have read *The Sheep and the Pasture Lands*, tell about the picture. See the brands on the sheep's bodies. Why are the sheep branded?

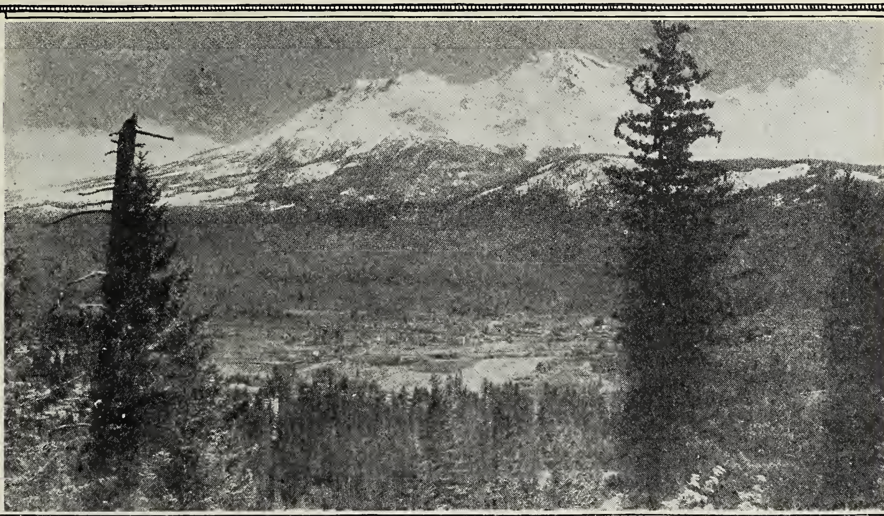

Fig. A. Mount Shasta, California. Find in the picture: valley farms, foothill pastures, timber line, bare rocks, snow fields, and clouds.

THE WESTERN STATES

A LAND OF MOUNTAINS, OF FRUITFUL VALLEYS, AND WIDE, OPEN SPACES

When you have studied this chapter, be sure that you can prove that each of the eleven Western States has some of each of the three things mentioned in the title. Make your own list of the different ways by which the fathers and mothers who live in these states earn a living for their children, and also a list of the different ways in which the country helps them to do this.

THE SHEEP AND THE PASTURE LANDS

Shearing sheep. On a warm day in June the sheep on a ranch in the Great Plains of eastern Wyoming are hanging their tongues out and panting because thick coats of wool make them so hot! Soon the shepherd and his dogs drive the sheep into a big yard or corral (Fig. 308-B). Here men catch the sheep, one by one, and take them into a shed where sheepshearers are waiting to clip the hot coats from the panting sheep. The shearers use clippers much like those used by your barber, only they are larger and are run by a gasoline engine that keeps a dozen pairs going. After a few days' work, the sheepshearers go on to the next ranch, leaving six thousand sheep coats (fleeces) tied up in bundles. When stuffed into big sacks, the fleeces are ready to be taken to the railroad station by motor truck, packed into freight cars, and started on their way to a mill that makes cloth. The station to which this rancher takes his wool is Cheyenne, in the state of Wyoming. Find Cheyenne on the map (Fig. 307-A). The sheep ranch is near Cheyenne, in a level plain where not


PHYSICAL AND POLITICAL MAP
OF THE
PACIFIC STATES
SCALE OF MILES
0 50 100 150 200 250 300
Capitals are shown thus SALEM
Limits of Great Basin
State Boundaries
REFERENCE
CITIES
Less than 5,000
5,000 to 10,000
10,000 to 25,000
25,000 to 100,000
100,000 to 250,000
250,000 to 500,000
500,000 or over
REFERENCE
HEIGHT OF LAND
11000 feet
5000
2000
1000
500
Sea Level
Below Sea Level
125°
120°
115°
110°
45°
40°
35°
Longitude West from Greenwich
1
2
3
4
BRITISH COLUMBIA
WASHINGTON
OREGON
IDAHO
MONTANA
WYOMING
NEVADA
UTAH
ARIZONA
MEXICO
PACIFIC OCEAN
GREAT BASIN
Seattle To Yokohama 4900 Miles
Seattle To Honolulu 2774 Miles
To Yokohama 6229 Miles
To Honolulu 2408 Miles
San Francisco to New York via Panama Canal 6059 Miles
Vancouver
Victoria
Bellingham
Anacortes
Everett
Port Angeles
Seattle
Bremerton
Tacoma
Hoquiam
Aberdeen
OLYMPIA
Puyallup
Centralia
Chehalis
Raymond
Longview
Astoria
St. Helens
Portland
Oregon City
Vancouver
Spokane
Wenatchee
Ellensburg
Pullman
Yakima
Walla Walla
Pendleton
The Dalles
Hood River
La Grande
Baker
McMinnville
SALEM
Corvallis
Albany
Lebanon
Prineville
Bend
Eugene
Roseburg
North Bend
Marshfield
Grants Pass
Medford
Ashland
Klamath Falls
Lakeview
Burns
Nampa
BOISE
Twin Falls
Idaho Falls
Pocatello
Ogden
SALT LAKE CITY
Yreka
Crescent City
Arcata
Eureka
Redding
Red Bluff
Susanville
Winnemucca
Elko
Ely
Chico
Ft. Bragg
Willits
Grass Valley
Reno
Sparks
Marysville
Lakeport
Santa Rosa
Virginia City
CARSON CITY
SACRAMENTO
Napa
Vallejo
Richmond
Berkeley
Stockton
Modesto
San Francisco
Oakland
Alameda
Palo Alto
Santa Clara
San Jose
Santa Cruz
Salinas
Monterey
Fresno
Tonopah
Goldfield
Las Vegas
Paso Robles
San Luis Obispo
Bakersfield
Mohave Desert
Santa Barbara
Glendale
Santa Monica
Pasadena
Los Angeles
Long Beach
Alhambra
Whittier
Pomona
San Bernardino
Redlands
Riverside
Ontario
Santa Ana
San Diego
El Centro
Yuma
Prescott
Jerome
PHOENIX
Salton Sea
Imperial Valley
Colorado Desert
Death Valley
YOSEMITE NATIONAL PARK
SEQUOIA NAT. PARK
CRATER LAKE NAT. PARK
YELLOWSTONE NATIONAL PARK
GRAND CANYON NAT. PARK
Mt. Rainier 14,408 FT.
Mt. Shasta 14,161 FT.
Mt. Whitney 14,496 FT.
Mt. Hood 11,225
Great Salt Lake
Great Salt Lake Desert
Copyright, The John C. Winston Co.

Fig. A

HU-1


M N O P
1
2
3
4
PHYSICAL AND POLITICAL MAP
OF THE
PLATEAU STATES
Continental Divide
SCALE OF MILES
0 50 100 150 200 250
Capitals are shown thus DENVER
State Boundaries
Limits of Great Basin
REFERENCE
HEIGHT OF LAND
10000 feet
5000
2000
1000
500
Sea Level
Below Sea Level
REFERENCE CITIES
Less than 5,000
5,000 to 10,000
10,000 to 25,000
25,000 to 100,000
100,000 to 250,000
250,000 to 500,000
500,000 or over
120° 115° 110° 105° 100°
45° 40° 35° 30°
115° Longitude West 110° from Greenwich 105°
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
WASHINGTON
MONTANA
IDAHO
OREGON
WYOMING
NEBRASKA
NEVADA
UTAH
COLORADO
KANSAS
OKLA.
CALIFORNIA
ARIZONA
NEW MEXICO
TEXAS
MEXICO
PACIFIC OCEAN
GREAT BASIN
Colorado Plateau
HELENA
BOISE
SALT LAKE CITY
CHEYENNE
DENVER
SANTA FE
PHOENIX
CARSON CITY
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Fig. A

HU-1

Fig. A. Shearing sheep on a big ranch. The man at the left holds the wool from one sheep. Find the sheep which is being sheared.

Fig. B. The forest ranger and the sheepman count the sheep as they enter the national forest on the Wasatch Mountains (Fig. 307-A) for their summer pasture at so much a head. Find the scared sheep that jumped high.

a tree is to be seen. By selling fleeces, the rancher gets money to buy some of the many things he needs, and perhaps to send his children to school and to college.

The herder hunts pasture for the sheep. The sheep are much more comfortable without their woolen coats. The herder now takes his flock out on the plain to eat grass again. The spring rains have made good pasture; the sheep grow fat. But the rains soon stop and the weather gets even hotter. The grass becomes brown and parched. The sheep eat all that is near the ranch, and each day the herder drives his flock westward toward the mountains in search of grass.

There are two thousand sheep in the flock, or *band*, as it is called in the West, and the herder follows his sheep by day and camps near them at night. He has two dogs, three mules, and a canvas-covered wagon with a bed, a stove, and many boxes and cupboards in it. He cooks his own meals, and every week or two the owner of the sheep sends out a fresh supply of food. For days or weeks at a time the herder sees no one. Some men love this kind of life, and once they have herded sheep they will do nothing else. They like to live in a wagon or a tent near the sheep, and are at home only a few weeks in the year.

The dog helpers. The herder could not get along without his dogs. They are more helpful in bringing straying sheep back to the fold than men could be, because a dog runs more swiftly than a man can run, and dogs do exactly what the herder tells them to do. At night they wake the herder if wild animals come near. If wolf or fox or coyote comes sneaking around, the herder's rifle may bring the enemy down. If a ranchman has several bands of sheep, he usually hires one man who does nothing but hunt coyotes, wolves, and bobcats. These animals love to catch and eat lambs.

Each day the shepherd and his dogs lead the flock a little farther west. One morning at sunrise he sees a white speck far in the distance. It is the sun shining on the snow on the top of the Rocky Mountains. For two weeks he travels toward the mountains. As he gets nearer, the mountains seem higher; at least they seem like a great wall standing above the

Fig. A. Irrigating a field of young alfalfa in Nevada, near the foot of the Sierra Nevadas. What will become of the alfalfa? It often takes much work to make the ground level enough to irrigate in this way.

plain. At the top, snow; below the snow, bare rocks and grass; below this, evergreen trees cover the sides of the mountains.

High elevations are cool. People in airplanes find that the weather is very cold a mile or two above the earth. Even in hot weather they wear very thick, warm clothing. It is the same on mountains. The tops of high mountains are much colder than the land at their base.

Rain on the mountains. As the shepherd goes toward the mountains with his sheep, he often sees clouds around the mountain tops when the sky over his head is cloudless. He can even see showers of rain falling on the mountains some miles away, when no rain falls where he is.

The sheep enter the mountains. Finally the flock reaches the mountains and follows a stream that comes splashing and foaming down its narrow valley. Small trees are here, for this place gets more rain than does the plain. Here the shepherd must leave his wagon; it cannot go up the narrow, rough trail of the mountain valley. The mules can follow the rough trail, so the shepherd puts his tent, stove, mattress, blankets, cooking utensils, and food into packs which he balances across the backs of the mules. During the season in the mountains, the herder has a helper who attends to moving his camp for him. For a few hours they climb up slowly through the narrow valley to a place where they camp for the night. The higher they go, the larger the trees become, until, finally, there is a forest of tall pine trees standing close together. More than twice as much rain falls here as at the ranch on the plains to the eastward.

The high pastures. After climbing several thousand feet, the sheep get out of the narrow valley and come to the rounded top of a ridge. The ridge runs out from the main mountain and separates the valleys of two streams that flow down out of the mountains. On the ridge are many open grassy spaces where no trees grow. The sheep stay here for two weeks. Then they go even higher, to the grass lands above the timber line. There the nights are always cool and frost comes late in spring and early in autumn. It is too cold and windy for trees to grow, but the

Fig. A. Sheep digging through the snow to get dead grass. What happens if hard crust forms on the snow?

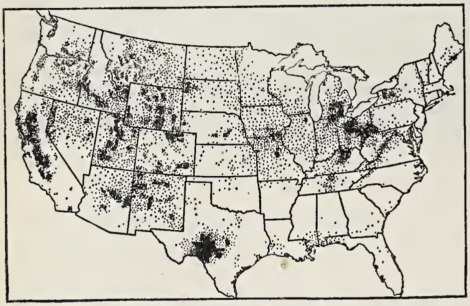


Fig. B. Each dot represents 5000 sheep and lambs. Two thirds of these animals are in the western part of our country because they can live in dry country better than any other domestic animal except the goat. See Figure 343-A.

bright sun of the summer days makes good grass. The sheep have come a long, long way; they are eight or nine or ten thousand feet above sea level. Find that elevation on the physical map of North America.

When the first snow flies, the herder drives his flock slowly back to the ranch, camping along the way while the sheep graze. At last they reach home, and the lambs that were born in the spring are now sent to market.

Sheep from Mexico to Canada. Herders with their big flocks of sheep may be found every summer on the Great Plains which lie east of the Rocky Mountains, in every one of the Plateau States (Fig. 307-A) from southern New Mexico to northern Montana.

Growing food for sheep. Some of the sheep belong to men who own valley land near the streams that flow down from the mountains. These lucky sheep have alfalfa to eat during the winter because the water from the streams is used to irrigate the land in summer. Irrigation, you know, is the artificial watering of crops. The farmer builds a dam across a stream, and makes a ditch or canal (Fig. 309-A) through which the water flows out to the fields. He then digs smaller canals to carry the water from the main canal to all parts of the field so that all the crops may be watered. As you ride across the Great Plains you come to a place where you look down into one of these river valleys. The plain where you stand may be brown and dry with August heat, but the valley is dark green with the fresh growth of irrigated alfalfa. There are also great stacks of alfalfa hay scattered about in the valley. This is a fine place for sheep to spend the winter. They eat the alfalfa until grass grows again in the spring. In dozens of valleys of the streams that cross the Great Plains there are fields of alfalfa that are irrigated.

Winter on the open plains. Some of the sheep on the Great Plains are not so fortunate, because they happen to belong to men who have no irrigated land and no haystacks. For their winter food these sheep must eat the dried grass that has been left from summer. Sometimes it is covered with snow that is so hard that the sheep cannot dig through it. The sheep may then starve to death before the snow melts and they can again reach the grass.

Sheep west of the Rockies. I once visited a sheep owner on the west side of the Rocky Mountains in northwestern Colorado, between the two branches of Green River shown on Figure 307-A. At seven

o'clock on an August morning, the sheep were eating breakfast in a flowery pasture on the rounded top of a mountain 9600 feet above the sea. At ten o'clock they went to bed for their midday nap under a grove of spruce trees in a little valley 400 feet below the top of the mountain. While the sheep were sleeping, the shepherd and a boy from Chicago, who was his helper for a vacation job, rested in their tent beside a near-by spring. They knew that the sheep would sleep until four o'clock, and that even the coyote, their enemy, sleeps in the middle of the day.

Plant growth changes with elevation. As I went down to the valley of the White River, a branch of the Green River, I saw a fine forest at 9000 feet, a scattering forest at 8000, small trees at 7000. At 6000 feet the valley of the White River had only small, round bushes scattered here and there, with the bare ground showing between. The rainfall there is only six inches a year. This is not enough to make good grass or big trees. But the sheep like to nibble the bushes. When the snow comes on the mountains, the sheep will be in a valley, nibbling here and there, and when December snow comes, they will be still farther down the valley, at an elevation of 5000 feet, near the upper waters of Green River.

Winter on desert pastures. Here the sheep spend the winter, without haystacks, living on what the rancher calls desert pastures. When the snow falls on these bushy deserts, the sheep can go far out on land where there is no spring or stream to make drinking water. The sheep nibble the bushes and eat the snow for water. At no other time of the year can the sheep go on some of these deserts, because they must drink every other day, and it is several days' walk from any spring or stream to the center of many stretches of land where there is good bush food for sheep.

When spring comes they start back again on their 150-mile grazing journey up to the cool, high pastures.

Sheep—a widespread industry. This kind of mountain or desert land and this kind of sheep business may be found in most parts of the very large area between the Rocky Mountains and the Sierra Nevadas and the Cascade Mountains. There are some irrigated valleys with haystacks, and in some places herds of cattle are kept instead of flocks of sheep, but flocks and herds are the great widespread industry.

Map study. 1. Trace the boundaries of the Plateau States (Fig. 307-A) on a piece of thin paper. Paste your traced map on some heavier paper or on light cardboard. Print the name on each state on the map.

2. Put in the Rocky Mountains, the Cascades, the Sierras, the Coast Ranges, the Great Plains, and six rivers.

3. From the rainfall map find the places that have less than 10 inches of rainfall a year. Mark these on your map of the Western States.

4. With sharp scissors, cut along the boundary of each state. The game is to see who can put the parts together most quickly to make "The Western States." Keep this map until we have finished this chapter.

New expressions to use. 1. Fourteen in one paragraph: corral; shearer; clipper; fleeces; rancher; herder; Great Plains; spring rains; band; coyote; bobcats; mountain trail; summer pasture; timber line.

2. Seven in one paragraph: desert lands; irrigated; alfalfa; dam; desert pastures; bush food; yearly round trip.

Diaries. 1. Make a sheep's diary for a year. See who can make the most good entries. For instance, a sheep, if it could write, might say, "I tried to run away today, but——."

2. The diary of the boy from Chicago who helped the sheepherder whom I saw.

3. The sheepherder's diary.

Posters. 1. The class might make a poster with the title: "The Sheep Take a Trip."

2. "I Took a Trip in the Western States."

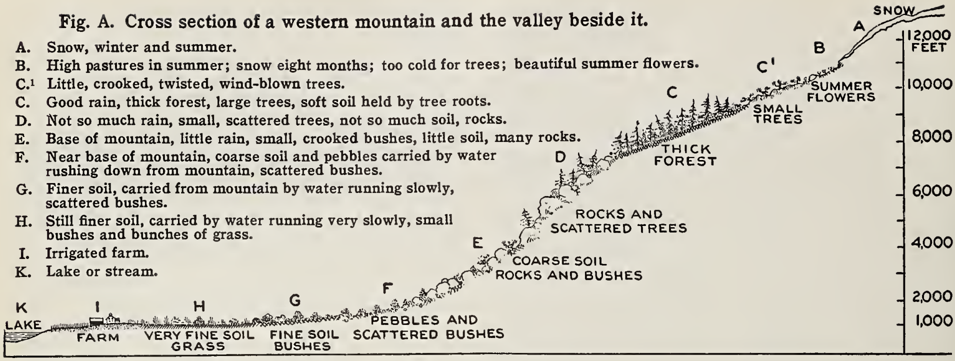


Fig. A. Cross section of a western mountain and the valley beside it.

A. Snow, winter and summer.
B. High pastures in summer; snow eight months; too cold for trees; beautiful summer flowers.
C.[1] Little, crooked, twisted, wind-blown trees.
C. Good rain, thick forest, large trees, soft soil held by tree roots.
D. Not so much rain, small, scattered trees, not so much soil, rocks.
E. Base of mountain, little rain, small, crooked bushes, little soil, many rocks.
F. Near base of mountain, coarse soil and pebbles carried by water rushing down from mountain, scattered bushes.
G. Finer soil, carried from mountain by water running slowly, scattered bushes.
H. Still finer soil, carried by water running very slowly, small bushes and bunches of grass.
I. Irrigated farm.
K. Lake or stream.

MANY KINDS OF LAND AND CLIMATE

A look at the part of the West we have studied

Suppose you had been at each place mentioned in this chapter. Make a list of all the different kinds of land or places you would have seen. You might call it samples of the West.

Study carefully Figure 312-A. It will show you how nature has arranged the samples in making this land of forested mountains, treeless valleys, and treeless plains. As you look at this figure, see if you can find something done by heat and cold, and wetness and drought, and by running water.

Mountains on plateaus. Not only are most of the Western States a series of plateaus, but there are hundreds and hundreds of mountain ranges that stand above the plateaus in nearly all of the land that lies west of the Rocky Mountains (Fig. 306-A). Many of these mountains are as high above the plateaus as are the ranges shown in Figures 305-A and 316-A above the land on which they stand.

Mountains — many mountains. From Denver you can ride toward the west all day on the train and still be in Colorado, and every moment you can see mountains. You can go on for another day across Utah and Nevada, and if the day is clear, you can always see mountains. In fact, one may see mountains from almost every place between the Rocky Mountains and the Pacific Ocean.

Variety of rainfall. Look at the rainfall map of the United States. What difference do you notice between the rainfall of the western half and of the eastern half? Does the rainfall map of the western part of our country tell you anything about the location of mountains? Look at the rainfall map and then at Figure 306-A. Now answer these questions: What is the elevation of the places that have heavy rainfall? of the places that have light rainfall? Where is the heaviest rainfall and the lightest rainfall you can find?

Sharp differences in short distances. You see few sharp differences as you travel in the Atlantic Coast Plain of Virginia, North Carolina, South Carolina, Georgia, or across the Cotton Belt or Corn Belt. There you will see the same kind of country throughout a whole day's journey. It is altogether different in the Western States. There you will find hundreds of places where a few hours on horseback will take you from a plain or valley that is brown and dusty, too dry for farms, up through thin forest, and then to the fine big trees on a mountain side, and then on to the timber line and up to cool pastures bright with flowers. In the West one sees sharp differences in short distances.

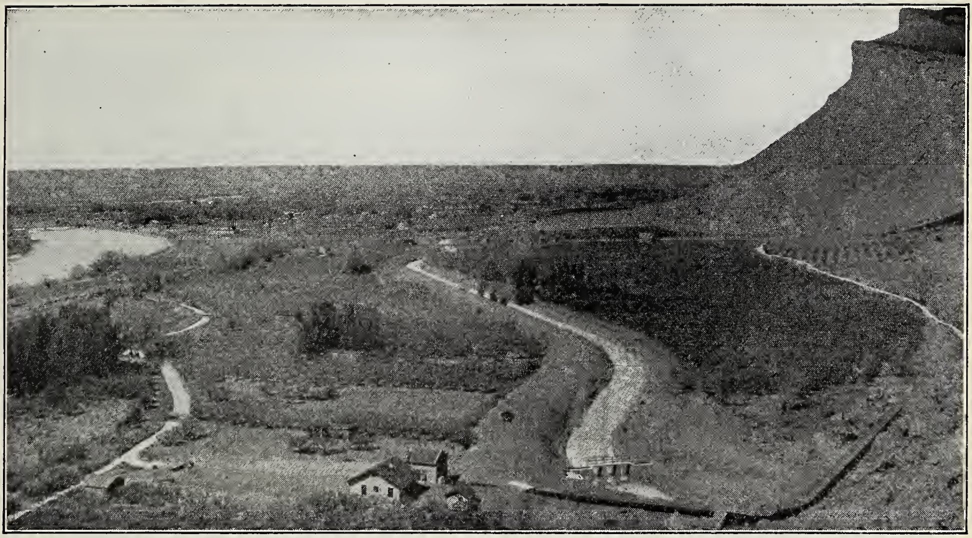


Fig. A. An irrigated peach district in the Rocky Mountains. Find the orchards, the shade trees around the houses, a river, and two irrigation canals. The large canal with the bridge over it leads into a tunnel. The smaller one at a higher level is in a wooden flume, which we see at the bottom of the picture. Its water can be seen at the left and at the right of the picture. Why would you say the cliff at the right had layers of hard and layers of soft rock?

California shows us how great can be the difference in places that are near each other. Find Sequoia National Park in the Sierra Nevadas (Fig. 306-A). Here are the amazing big trees shown in Figure 340-B. They are part of a splendid forest, where the trees are twice as tall as those to be found anywhere east of the Rocky Mountains. Beneath these forest giants are dashing mountain streams, with darting trout and waterfalls. Beside the streams are flowers and shrubs, and little trees grow underneath the big trees. The place is cool and pleasant. Thousands of visitors go there each year for vacation trips.

Death Valley. On the other side of the Sierras, only a hundred miles distant, is a very, very different kind of place. It is the valley where once a party of Forty-niners going out to California to find gold got lost. There was no stream or lake in the valley. Not a tree did they see. Not a bunch of grass could they find for the horses. There was only bare clay, bare sand, bare rocks, and in some places a crust of salt on the ground. The Forty-niners thought they could get through this place before they had used all the water they were carrying. They were mistaken. Their horses died of thirst. Their oxen died of thirst. And the men died of thirst, seeing visions of water.

The place where these men died is called Death Valley to this day, and, since that time, other men searching for gold have died there of thirst. Death Valley is a desert (Fig. 306-A), and a hot one. An egg will cook if laid in the sunshine on a summer day. A bucket of water will get hot enough to burn you when you try to bathe in it. Across this desert the air quivers with the heat, as air does in all hot deserts.

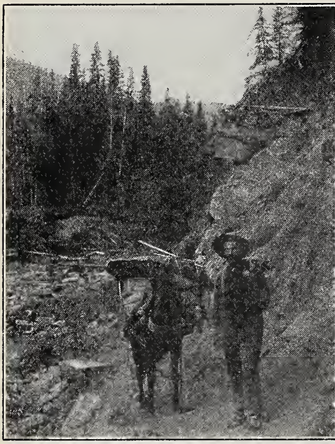


Fig. A. Tell a story about this prospector who is seeking precious metal in the western mountains.

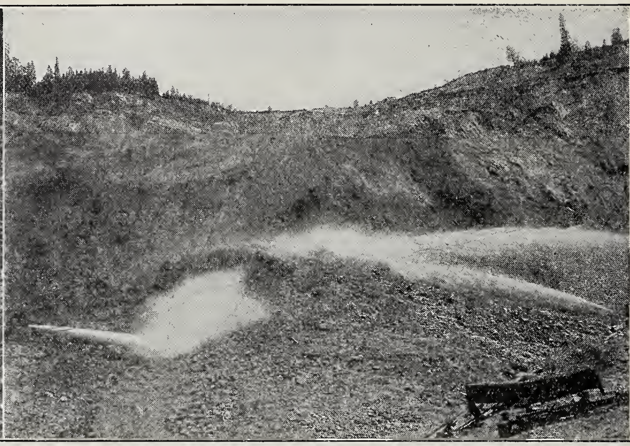


Fig. B. Powerful streams of water washed banks of gold-bearing sand and gravel through troughs with pockets in them. The heavy gold stayed in the pockets. What did the sand do to the streams?

Variety of temperature. The Western States have every kind of temperature, from this blazing Death Valley to mountain tops where snow and ice and small glaciers lie in the hottest days of summer. They have this desert, so dry that men do not cross it; and they have mountain slopes where the thick growth of trees drips with water almost every day.

A map game. 1. On a blank map of the West, put Cascade Mountains, Sierra Nevadas, Rocky Mountains, Coast Ranges.

2. Write (1), (2), (3), etc., where the following places are located: Death Valley, Sequoia National Park, Denver, Albuquerque, Helena, Salt Lake City, Phoenix, Spokane, Pocatello.

3. Mark on this map the areas having heavy rain.

4. Exchange papers with your neighbor and see if he can tell what the numbers on your map stand for.

5. Draw a large map on the board, and make a team game of this exercise.

A radio talk. 1. Prepare a radio talk on Sequoia National Park and Death Valley; be sure to use the words *east slope* and *west slope*, and *sharp differences in short distances*. Let someone be announcer and introduce your talk as one of the series of the American School of the Air.

FUR HUNTERS AND MINERS

The fur hunter. The first white people who settled in New England, in Virginia, and in most of the states along the Atlantic coasts were farmers. They came with their wives and children to make farms and to build homes in the new land. Very few women, however, went with the first white men to the Western States. The first white men to go were the fur traders and fur hunters—men who liked danger. From towns along the Missouri River they rode away on their ponies, across the plains and into the mountains. They came back to the forts on the Missouri — if they were lucky enough to get back — with bundles of skins of fur-bearing animals which they had shot, trapped, or bought from the Indians. Sometimes the men were lost in blizzards, lost in deserts, or lost in fights with the Indians. From that day to this, hundreds of men have made and now make their living in this wide region by selling the skins of the animals which they shoot or catch in traps.

The prospector. The early fur hunter was soon followed by the prospector, a

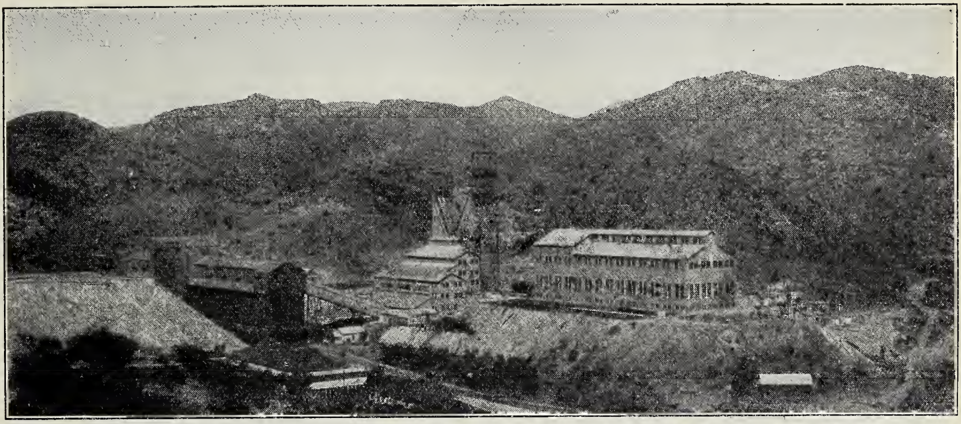


Fig. A. These buildings by an Arizona copper mine contain much machinery for handling and sorting the ore. What does the picture tell you about the climate of this place?

lone man hunting in gully or on mountain side for signs of precious metals. Prospectors hunted everywhere in the mountains for gold, silver, or copper, for which men will pay money and which have made some men suddenly rich. These metals are mostly found in stone that contains much other material that is of no use to anyone. We call this mixture *ore.* Perhaps the lone prospector lived in his tent. Perhaps he rolled up in his blankets and slept on the pine needles or the bare ground. Some prospectors hunt all their lives for good mines and find barely enough ore to buy food. Men have been hunting, hunting, hunting for gold since the days of the Forty-niners.

The miner's claim. Once in a while a prospector will find a stream with bits of gold in its sands; or in the rocks he may find a seam of gold or gold ore. The "find" may make him wealthy. Other miners flock there to try their luck. If a prospector finds good ore, he stakes out a piece of land, called a *miner's claim,* and the government gives the piece of land to him. In many places great holes in the hillsides show that prospectors have hunted gold there, though often in vain.

Fig. B. Two of the Forty-niners who went to California in search of gold. Tell what the miners are doing.

Stream gold—stream gold. In 1848 gold, found in the sands of the American River, a stream draining into the Sacramento Valley, started the first great industry of the Western States (page 242). When streams flow through a mountain country, they wear away rock and shift sand and gravel about. If gold is present in the rock, bits of the gold are broken loose and carried along by the water. Miners sometimes separated the grains of gold from the sand by panning (Fig. 315-B). Miners even scraped with spoons the crannies in the rocky beds of the stream. After the miners had taken the gold from the stream beds, they found that small

Fig. A. A view of Leadville, Colorado. This city is almost two miles above sea level. In the distance is Mt. Massive, 14,202 feet high. See piles of refuse around the mouth of a mine. Is this a good place for a garden?

quantities of gold could still be washed from banks of sand and gravel lying along the streams, by a method called *placer mining* (Fig. 314-B). Sometimes great banks of sand and gravel that happen to be in low land are scooped up and washed by machines called *dredges*. Dredges are driven by steam or electricity, and separate the gold from the sand as is done in placer mining.

Gold from the ore. When no more gold could be washed from the sands of the California streams, miners followed the streams back into the mountains until they found the rocks from which the streams had carried the gold. This gold-bearing rock is called a *mother lode,* because the gold grains in the stream bed came from it, and, one might say, are its children. Expensive machinery and much work are needed to get the gold from the rocks of the lode, so this kind of mining is usually done by a company rather than by one man.

The ore (mother lode) is usually ground to powder, and the grains of gold are separated in much the same way as from the sands along the streams.

The mining town. A town soon springs up where precious metal is found, even though the location is poor for a city. Leadville, in Colorado, is such a mining town. It is so high above sea level that most food crops cannot be grown there on account of the cold. Some years there is frost at Leadville every month. It is the highest city in the United States, being nearly two miles above the sea (10,150 feet).

When the miners have dug all the gold, silver, and lead from the mines, nearly everyone, perhaps every person, will move away from Leadville. Many mining towns have been abandoned entirely, and others have sprung up in new places within a few weeks after the discovery of gold.

A few years ago gold was found in the Nevada desert. Miners rushed there, railroads were quickly built, and soon the thriving towns of Tonopah, Goldfield, and

Bullfrog stood on land so dry that no one could have a garden, or even a shade tree. But as long as enough gold comes out of the mines and railroads carry freight, the people who live there can buy all kinds of things from distant places.

The copper centers. At Butte, Montana, is a great hill with many wonderful seams, or *veins*, of copper ore that run deep into the ground. Thousands of men work there. To reach the ore, they have dug underground tunnels and passages in all directions. Under this one hill there are hundreds of miles of abandoned tunnels. Every year many thousands of carloads of copper ore are lifted to the surface by electricity.

Copper is now smelted largely by the "conveyor" process. This method heats the copper and drives off the other substances that are found with the copper. Tall smokestacks of the copper smelters rise high above the mining towns.

Butte produces almost nothing to sell except copper and silver, but these are of great value, and much money is received from their sale.

The mines of Butte made it possible for Montana to produce more copper than any other state for a few years; but now the state of Arizona leads Montana in producing copper. Bisbee, Douglas, and Globe are other copper-mining centers.

The copper town of Bingham, near Salt Lake City, has but one street. It is several miles long because the town is built in a narrow gulch. At Bingham, and at Ely in eastern Nevada, and at some places in Arizona, copper ore has been found in deposits that can be worked with steam shovels. This method is much easier than getting out ore with pick and shovel, and it is safer than digging ore underground. Mining is hard and often dangerous work. Sometimes when the men are hundreds of feet below the surface, digging passages in the rocks and blasting with dynamite, great masses of rock fall in on them, or imprison them far underground.

Fig. A. In a copper mine. A miner is using a compressed-air drilling machine to make holes in the rock for the explosives.

Hide and seek. 1. Copy the following list of names in a column. Beside each name write a few words to suggest what the name stands for: Butte, Leadville, Salt Lake City, Ely, Bisbee, Douglas, American River, Globe, Nevada Desert, Tonopah, Goldfield, Bingham, Bullfrog.

2. Now cover the column of names and see if your neighbor can guess the names from your description.

Add to your map. Add the names given above, using (a), (b), (c), etc., to show where they are, unless you can print the names in small letters.

New words to use in sentences about mining. Placer mining, prospector, abandoned town, shaft, ore, Forty-niner, seam or vein of gold ore, miner's claim, panning for gold, dredges, mother lode, copper smelter, gulch, blasting.

Some letters. Write a letter such as a Rocky Mountain fur trapper or a prospector might write to his brother in New York, to whom he had not written for a year.

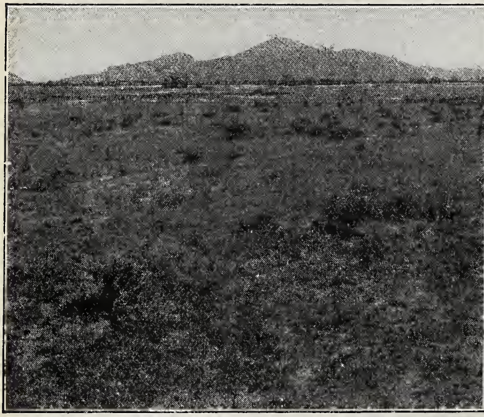


Fig. A. A western valley before irrigation. See the scattered vegetation. It takes many, many acres of land like this to support one family.

Fig. C. This is the same valley as in Figure 318-A, after irrigation has made it good farm land. A farm of 40 to 80 acres now supports a family in this valley.

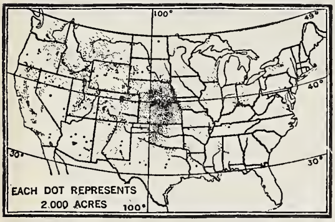


Fig. B. Where alfalfa is grown in the United States. Trace some rivers by the strings of alfalfa land. Why do the alfalfa areas follow the streams?

THE FARMERS COME

Food in a mining camp. If you tried to live in a mining camp back in the mountains three or four hundred miles from any farm or railroad, what would you eat and how would you get it? Thousands of men have asked themselves that question many times in the Western States since the beginning of the gold rush of 1849. This chapter will answer the question.

The first farmers. When the Forty-niners reached San Francisco, many of them had very little food left to eat. Luckily some farmers had settled in the Willamette Valley of Oregon and were sending food crops by boat to San Francisco. The farmers were lucky, too. There were times when the farmers sold apples at San Francisco for fifty cents each, and potatoes for a dollar a pound.

The scattered mining camps of the early days made a sudden demand for farm produce. To supply food, farmers of Colorado, Montana, and Idaho began at once to irrigate patches of valley land and to grow vegetables, potatoes, grain for flour, and alfalfa for hay.

The freight that passed between the mines and the railroads was carried by animals, and much hay was needed to feed the animals. If the miners who first went in could not buy food from near-by farmers, food had to be brought hundreds of miles by train, by wagon, pack animal, or even on man back. The cost for carrying had to be added to the price paid for food. So the miners paid high prices for what they bought. High prices made more farmers want to plant crops. Before long the farmers in the valleys of the Western States produced more than the near-by people needed, and that made a very great change in prices. The farmer now had to send his surplus produce to distant markets, such as Chicago. He had to pay the freight *to* Chicago and take that freight money *from* the Chicago price. He had been getting the Chicago price

Fig. A. Here are two pictures. Which picture shows cattle on a ranch in the Western States? Which picture shows cattle eating corn on a farm in the Corn Belt? The lean ranch cattle are sent to the farms of the Corn Belt for fattening.

and also receiving as much more as it would take to pay the freight *from* Chicago.

Irrigation and the haystack. When the farmers of the Western States had supplied themselves and the mining towns with food, they developed the business of raising sheep, cattle, and horses to ship to the cities of the East. Nearly everywhere hay for winter food for the animals was needed. Therefore farmers came to almost every little valley where they could get water to irrigate the land, and there grew alfalfa, oats, and barley to feed the animals through the winter. To see where the alfalfa is grown and eaten, look at the map (Fig. 318-B). In what states do you find it?

Mutton, wool, and beef. The most *widespread industries* of the Western States are named in three words: sheep, cattle, alfalfa. The cowboy on his horse with his lasso, the shepherd walking with his dogs, the farmer leading streams of water to his fields — these are found in every Western State and in more than half of the counties in the Western States.

The fruitful valleys. The sheep and cattle are the most *widespread* industry of the West, but the fruits and vegetables from irrigated valleys bring in more money by far than all the other crops that man grows in this part of our country. Many valleys are found among the many mountains, but five lead all the rest. Turn over the pages until you find the names of the five valleys.

Letters about business. Write such letters as the following men might have written telling about their business:

1. A farmer in Oregon before gold was discovered in California.
2. His letter after gold was discovered in California.
3. An early prospector in the mountains of Idaho.
4. The first farmer in a Colorado valley, ten miles from a rich mining camp and 300 miles from a railroad.
5. The same man after the railroad reached the mining camp.

Fig. A. The Grand Canyon of the Colorado. Find a layer of hard rock; of soft rock; a layer of rock that lies flat. At this point the canyon is twelve miles wide and the rocks are of many beautiful colors.

THE LOWER COLORADO VALLEY

A river builds desert land in a sea. The running water of the Colorado River wore away the earth and stone, and cut the Grand Canyon of the Colorado (Figs. 307-A and 320-A) in the Colorado Plateau. The river carried the particles of earth and sand along and dumped them into the Gulf of Lower California. Much of the land in the present Imperial Valley was once covered by the gulf, but the Colorado River built up a wide delta and finally cut off the waters of the gulf. The delta land, built up by the river in the old gulf, is now the rich, flat, and almost rainless Imperial Valley. Some of it is below sea level. The Salton Sea (Fig. 306-A), formed by an overflow of the Colorado River in 1905–1906, is about 250 feet below sea level. It is now about thirty feet deep, but is drying up gradually.

Forty years ago no one lived on hundreds of square miles of this land. Now it is the home of thousands of people. This change took place because the first settlers dug an irrigation canal. This led the waters of the great river out into the desert. Now water from rains and snows in the Rocky Mountains is used for irrigation in the Imperial Valley, in much the same way that water from the Nile River is used for irrigation in Egypt. Your teacher will show you a map with Egypt on it. The Imperial Valley is often called the *American Egypt.* How far north of the equator is Yuma, Arizona? Cairo on the Nile? The climate of the two Egypts is much alike. Therefore they both produce the same kinds of crops — dates, Egyptian cotton, alfalfa, Kafir corn, and early vegetables. A great farming industry has grown up quickly in the Imperial Valley, for the level soil is rich and deep; the long season makes plants grow almost every day in the year, and the hot sunshine makes them grow quickly.

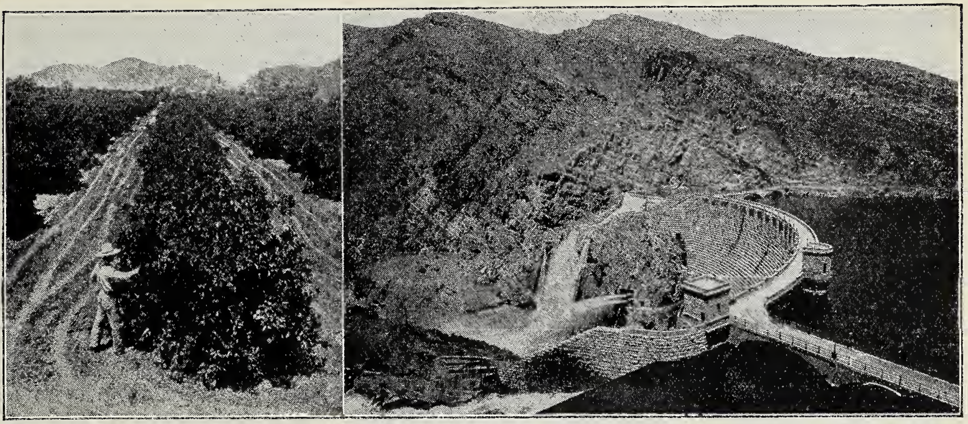


Fig. A. The Roosevelt Dam and one of the irrigated farms of the Salt River Valley, eighty miles from the dam.

Truck farming in Imperial Valley. The Imperial Valley cantaloupes ripen weeks before those grown in the Atlantic coastal plain. For a month cantaloupes are shipped (sometimes three hundred carloads a day) to nearly every state in the United States. Lettuce and many other kinds of early vegetables are also grown for shipment to distant cities early in the season.

Dates. The Arabs say that their great food tree, the date palm, loves to grow with its feet in the water and its head in the fires of heaven. The Imperial Valley is almost a perfect home for the date. There is plenty of water for irrigation. The soil is excellent for date palm trees, and the warm rays of the sun furnish all the heat that the date palm requires. There are now hundreds of date farmers in the hot lowlands of the Imperial Valley. Most of the dates are packed and shipped to all parts of the country.

Along the highways through Imperial Valley are many roadside stands. Each year thousands of dollars worth of dates are sold to tourists motoring through the valley.

Storing water to make butter and cotton. The Salt River Valley near Phoenix is much like the Imperial Valley. It has thousands of acres of soft, rich soil that the river has brought down from the mountains. How to make use of this fertility was a puzzle. Here was the good land, but there was so little rain that it was a desert. The river near by was almost dry when the farmer wanted the water; and then, for a day or two at a time after heavy rains in the mountains, it was a rushing river so wide and deep and swift that no man dared try to cross. At last someone found, back in the mountains many miles up the river, a place where men could build a short, high dam (Fig. 321-A) that would hold the flood waters in a large lake. Instead of rushing away and making troublesome floods, the water now waits till men open a gate, and then it flows quietly into the fields where a man with a shovel and hoe leads it about to water his crops and thus to help feed us.

Crops in Salt River Valley. With plenty of water to irrigate this rich land, the people of the Salt River Valley near Phoenix, Arizona, began to grow vegetables and to plant orange, lemon, and grapefruit trees. (Oranges, lemons, and

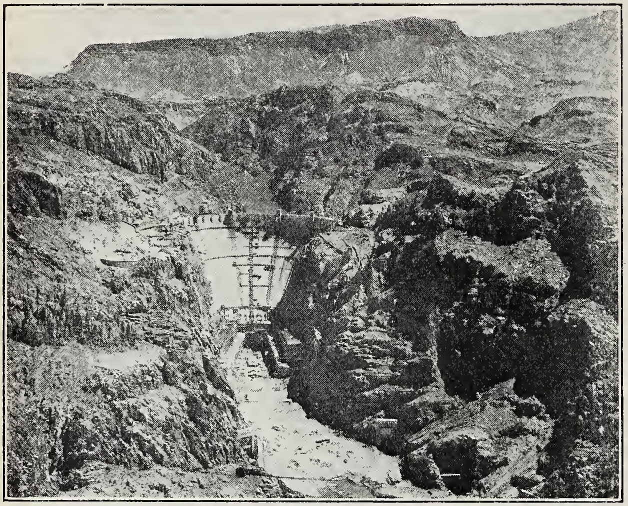


Fig. A. Boulder Dam completed May 29, 1935. When the picture was taken, work was still in progress on the power house in front of the dam. See the canyon in back of the dam.

grapefruit are called *citrus fruits*). Now each year thousands of carloads of lettuce, celery, and other vegetables are shipped from around Phoenix to mid-western, northern, and eastern markets. Arizona citrus fruits are to be found in almost any grocery and fruit store through the United States. Alfalfa, too, is an important Salt River Valley crop. It is an excellent food for cattle, and it thrives splendidly on the soil and climate here. Much of this alfalfa is fed to dairy and beef cattle. Much also is cut, baled, and shipped to northern and eastern sections of the United States to serve as winter feed for cattle.

A health and pleasure resort. In winter the weather of the lowlands along the lower Colorado River is clear and delightfully cool. The region has become a health and pleasure resort for people from other parts of the United States.

A great dam. In 1931 work was begun on one of the largest, highest, most costly dams in the world and one of the most difficult to build. It is the Boulder Dam (Fig. 322-A) in the gorge of the Colorado River (Fig. 307-A) near Las Vegas, Nevada. This dam is 700 feet high and 650 feet thick at the base. The water which it holds back forms a deep lake or reservoir almost a hundred miles long. Some of this water will be used to irrigate large areas of land on both sides of the lower Colorado River. A series of canals, tunnels, and pipe lines will carry some of the Boulder Dam water to Los Angeles and other cities. Power plants below the dam will be able to develop more electricity than is now being produced on the American side of Niagara Falls. This electricity will be used for power and light in the towns and cities of southern California and near-by states.

A free-hand sketch of a river. Looking at the map (Fig. 307-A), draw the Colorado River. Show its source; the canyon; the level land at its mouth; its branch, the Salt River. Show the land that is below sea level, and the place where the river gets snow water in June.

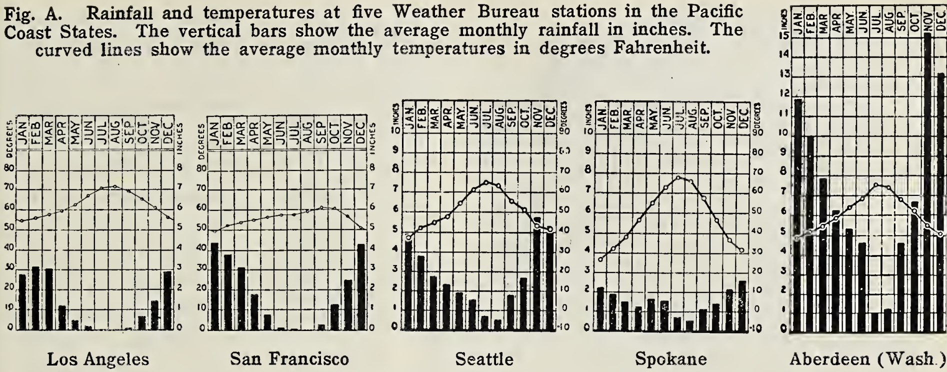
River work. Make a talk or write a few sentences on, "How the Colorado River made the Imperial Valley."

Questions to settle. 1. Discuss these problems: "The best kind of place in which to build a reservoir to furnish water and power is——." "Reservoirs may be profitable investments where ——."

Crop stories. Reread page 321. Write a story beginning "I am a fine large cantaloupe ——." Tell the cantaloupe's story and use the words: soil, sun, level, water, express, early.

2. Other stories may be about dates, cotton, alfalfa, or a pound of butter.

Fig. A. Rainfall and temperatures at five Weather Bureau stations in the Pacific Coast States. The vertical bars show the average monthly rainfall in inches. The curved lines show the average monthly temperatures in degrees Fahrenheit.



THE VALLEY OF SOUTHERN CALIFORNIA

Rich valley lands between the mountains and the sea. What does the rainfall map of the United States tell you about the part of southern California that has the mountains between it and the sea, and the part that lies between the mountains and the sea (Fig. 306-A)?

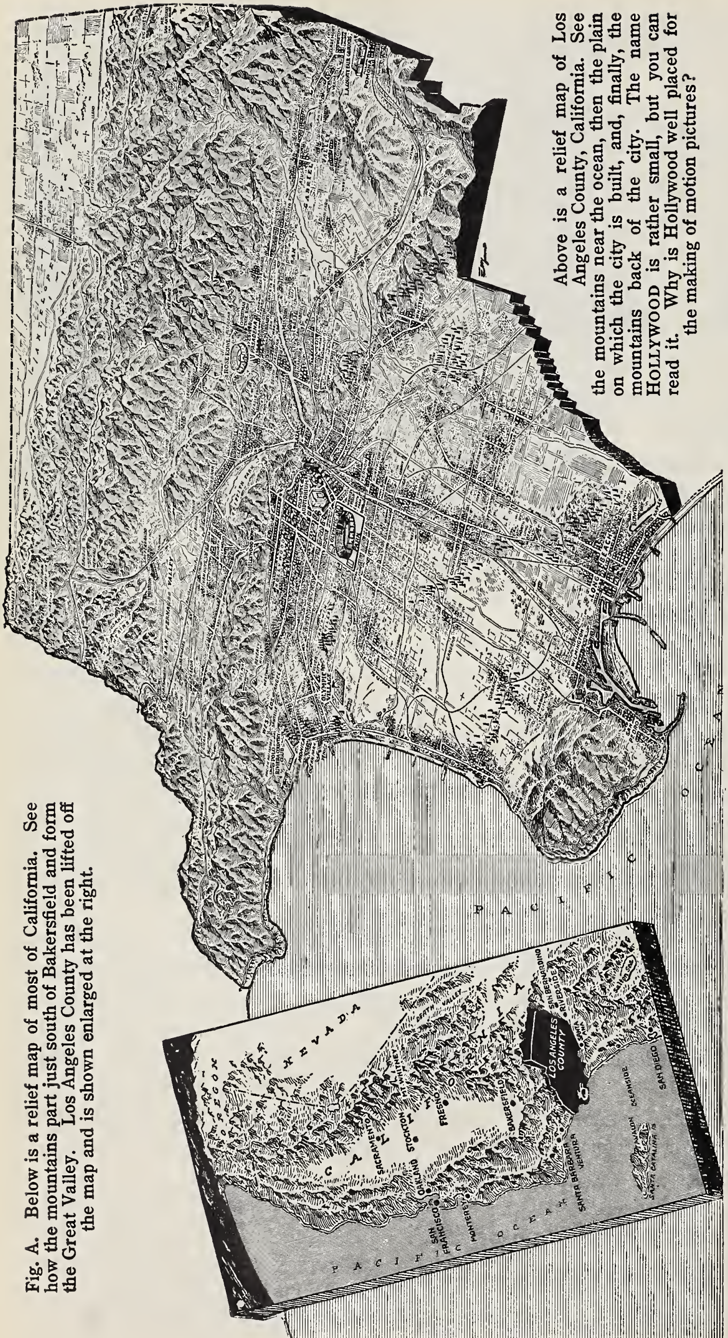
This small area of valley land tucked in between the mountains and the sea in the southern part of California is a small region, but an important one. It is the home of *many, many people.* The city of Los Angeles and its suburbs have more people than any other city west of Chicago. There are also dozens of towns near Los Angeles, and there are many farms that are so close together that you may think, as you pass them, that you are in a village miles in length. The people cover their little irrigated farms with fruit trees and truck; thus a little land is made to produce big crops.

A rainy season and a dry season. In this region, as in nearly all the rest of California, the rain falls chiefly in the winter and almost not at all for three months in summer. The reason is this: During the winter the land is cooler than the sea, and the sea wind, cooled by coming to the land, drops some of its moisture as rain. This causes the rainy season. Write in your notebook the rainfall of each month (Fig. 323-A) at Los Angeles.

From April to November the land is warmer than the sea. The sea wind is then warmed as soon as it strikes the land and thereby becomes a drying wind instead of a rain-bearing wind (page 312). For weeks and months at a time in summer the sun shines and there is rarely a shower. Write in your notebook the rainfall of Los Angeles (Fig. 323-A) for the months of April to November. The dust settles everywhere, even on the leaves of trees. Fields become brown except where water can be had for irrigation. Irrigated spots make patches of bright green in the brown land.

The struggle for water. The warm climate of southern California is so good for oranges, lemons, and other desirable fruits that growers make a great effort to get water to irrigate the soil. Where water can be had, land becomes very valuable. So much depends on water that men go to great trouble and expense to get it.

Where do they get all this necessary water? Melting snows in the mountains fill the reservoirs and store the water until needed. Deep wells tap the underground water and pumps force it into pipe



Above is a relief map of Los Angeles County, California. See the mountains near the ocean, then the plain on which the city is built, and, finally, the mountains back of the city. The name HOLLYWOOD is rather small, but you can read it. Why is Hollywood well placed for the making of motion pictures?

Fig. A. Below is a relief map of most of California. See how the mountains part just south of Bakersfield and form the Great Valley. Los Angeles County has been lifted off the map and is shown enlarged at the right.

lines and ditches which carry the water to the land. Rivers far back in the mountains and as far away as the Colorado River (Fig. 307-A) are also an important source of supply.

The southern California farmer does not usually have his own well as do the farmers and ranchers of the Middle West and the Southern States, so he must buy his water. Because of the great expense in getting water, companies were formed. Sometimes a group of farmers go together and form an association to get water. The water is divided among them in proportion to the number of acres of land each owns. In some localities water is quite expensive; in others it is very cheap. The cost, on the average, is about $20 a season to irrigate each acre of land.

Orchards on the slopes. Thousands of citrus groves now bedeck the slopes of many of the foot-

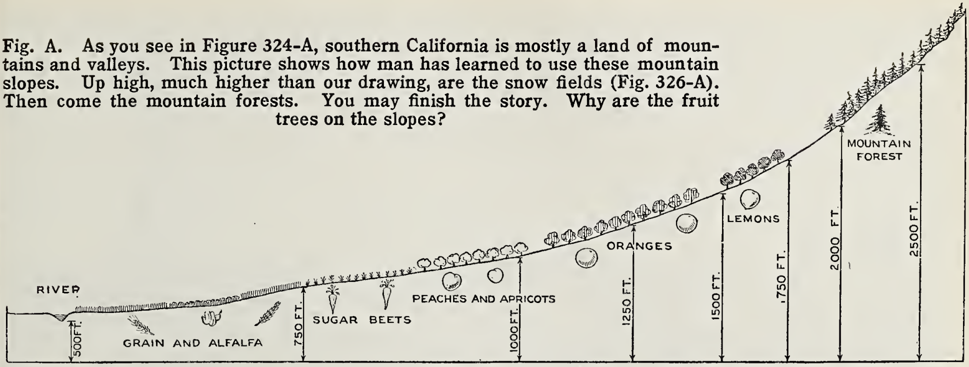


Fig. A. As you see in Figure 324-A, southern California is mostly a land of mountains and valleys. This picture shows how man has learned to use these mountain slopes. Up high, much higher than our drawing, are the snow fields (Fig. 326-A). Then come the mountain forests. You may finish the story. Why are the fruit trees on the slopes?

hills of southern California. Great groves of beautiful orange and lemon trees line the roads for miles and miles as one approaches Los Angeles from the east.

One of the most famous orange-growing sections is the San Bernardino-Riverside district (Fig. 326-A). Here thousands of acres of these groves give employment to several thousand men and women who pick, sort, pack, and ship the fruit. Each year the city of San Bernardino holds a great orange show with many beautifully designed exhibits all made from oranges. Many of the orange growers belong to a coöperative association through which they market their fruit.

Full use of the land. But crops other than the citrus fruits are also grown on the foothills and in the valleys. Where water is hard to get, grapes are sometimes grown because the grape can get along with a small amount of water. Where no water for irrigation is to be had, wheat and barley are grown. English (Persian) walnuts are grown quite extensively, and California-grown walnuts are shipped to all parts of the world.

Many families make a living by growing and selling peaches, potatoes, lettuce, celery, and other vegetables. The dense population in southern California makes a ready market for poultry and dairy products, and thousands of families make a living supplying these needs. In the dairy business alfalfa is an important crop and is grown quite extensively. Many farms contain only five or ten acres of irrigated land, but a very *intensive type of agriculture* is carried on. In no other part of the United States is land made to yield so much.

Forests are needed. The people of the California valleys are very anxious that the mountains from which their streams flow shall have forests on them. They know that trees help hold the rain water from rushing down the mountains and let it soak into the ground, when months later it can be pumped out through wells and used for irrigation.

The tourists and those who come to stay. The climate of southern California is good for crops, and people like it, too. It is never very cold in winter; so that you can be out of doors most of the time. In summer the land near the sea is cooled by sea breezes. The near-by mountains are cool.

There is variety in the scenery and you can go everywhere on good roads. Because of the charm of climate and landscape, millions of people visit California every year, and hundreds of thousands of people from the colder parts of the country have

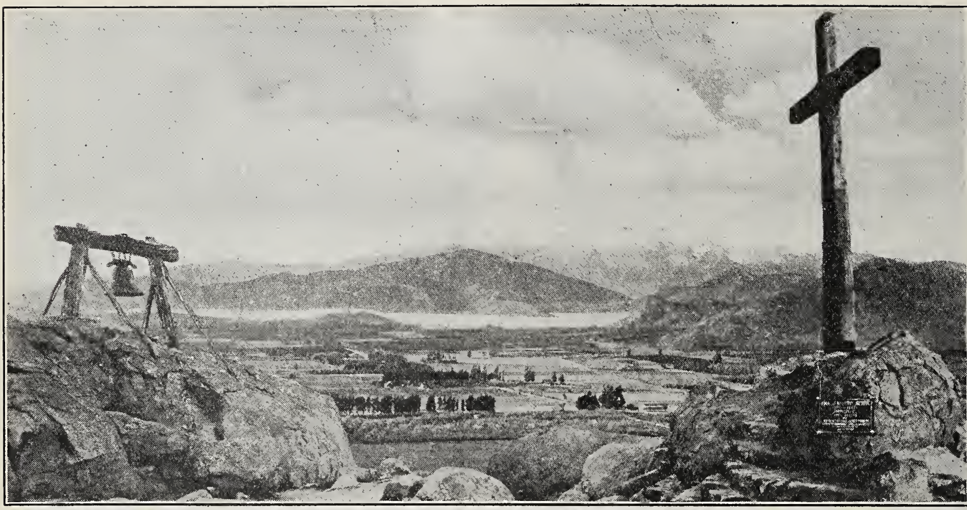


Fig. A. The person who took this picture was standing on Mount Rubidoux, near the city of Riverside, in the southern California orange district. He pointed his camera across the fertile valley of Riverside, toward the snow-capped mountains in the distance.

Fig. B. Winter sports in the mountains back of Los Angeles.

moved there because they like it as a place to live. Many people who have retired from active work in almost every state, go there to live.

Motion pictures. Hollywood, a suburb of Los Angeles, is the motion-picture capital of the world. Thousands of people work here at this industry. You can see a film from Hollywood in Japan, in China, in London, in Paris, in Jerusalem, in Africa, in Mexico, and in South America.

Southern California is a good place for making motion pictures because the actors and directors can work out of doors so much of the time, and can find almost any scenery, or *setting*, that they want. A short ride in an automobile will take them to sea beach or mountain side, to level plain or hill, to palm trees or pine trees, to orchard or field, to village, city, or empty desert. And then, too, the motion-picture actors and managers, like other people, find southern California a pleasant place in which to live.

Things to do. 1. Pretend that you have a ten-acre farm in southern California. On your farm is a little valley and some foothills. You have a good supply of water, but you can irrigate only a part of the foothill land. Make a chart showing what kind of crops you could grow on your farm. Figure 325-A will help you.

2. Look at the label on a box of oranges at your grocery or at the wrapper around an orange. Where did these oranges come from?

Fig. A. Blossom time in the Santa Clara Valley. What season of the year is it? This picture might have been taken in any one of the central California valleys. Why?

THE GREAT VALLEY OF CENTRAL CALIFORNIA, AND SEVERAL SMALLER VALLEYS

The Great Valley and several smaller valleys. On Figures 306-A and 324-A find, east of San Francisco, the Great Valley of California. How long is the valley? How wide? This part of the state was first settled by Spaniards, as was southern California. Many places still have Spanish names, but almost all other traces of the early Spanish settlers have vanished. The valley has been a part of the United States for nearly a hundred years. Many smaller valleys are tucked in among the Coast Ranges. Find Santa Clara south of San Francisco, and Santa Rosa and Napa to the north of it. Each is in a valley of the same name. The Salinas Valley, opening directly to the Pacific near Monterey, is the largest of the smaller valleys. North of the Salinas Valley are the Pajaro, San Juan, and Hollister valleys. All the smaller valleys of central California combined are not nearly so large as the Great Valley.

How nature made the valley. Nature built the Great Valley in a way that makes it very easy for man to use the land. This valley was once a large gulf like its neighbor, the Gulf of California. Mountain streams worked at this gulf, just as the Colorado River did at the Gulf of California. Streams carried earth down from the mountains and filled the valley. This gave the valley rich soils and it gave a gentle slope to the land (Fig. 328-A). Irrigation canals can be built along the upper sides of the fields on these gentle slopes. Make a blackboard map to show a part of the valley. Show where the canals would be. Mark a place where you think there might be a gate in the canal. When the gates are opened, the water will flow gently across the fields that lie down the slope from the canals. Read again the first sentence of this section and tell why it is true.

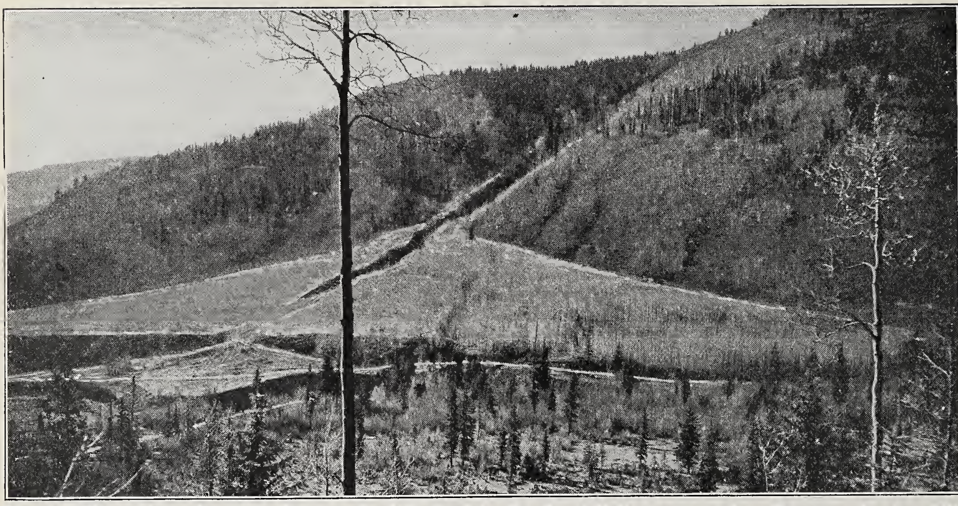


Fig. A. This picture shows you how much of the land in the Great Valley was made. Between the two hills is the narrow valley of a little stream. When it rains, the water washes rich soil from the hills and carries it into the stream. The stream rises, overflows its banks, and drops the soil so as to form a low, fan-shaped hill, such as you see in the picture. Such a hill is called an *alluvial fan*. The sides of the Great Valley in California are a long series of wide alluvial fans. They make good farms and they are easy to irrigate.

Climate. The rainfall of the Great Valley is like that of southern California. Because of the dry summer, few crops, except wheat and barley, can be grown without irrigation. The winter is mild, much like that of southern California, because the Sierras are high enough to shut off the cold winter winds from the interior, and because the Coast Ranges are low enough to let the winter winds blow in from the Pacific, where the water has warmed them (page 323). Thus the city of San Francisco passes winter after winter without the temperature dropping to the freezing point for an hour, yet in summer the daily sea wind is so cool and so regular that visitors from warm countries wear light overcoats every day, even in August. While people are wearing their overcoats in San Francisco, the temperature of the Great Valley, only thirty miles away, is sometimes 100° in the shade. This is because the sea breezes do not reach far into the Great Valley.

How the industries have changed. At first the only industry of the Great Valley was pasturing sheep and cattle. In those days the Spanish settlers sold hides and skins, which were carried by sailing vessels to New England and to Europe by way of Cape Horn. Then for a time gold was almost the only export of California. After the reaper was invented, wide fields of wheat were planted in the level lands of the valley, and sailing vessels carried wheat from San Francisco to England.

Fruit is king. Fruit is now the king of California crops, and especially is it king of the Great Valley. For a long time the gardens of the old Spanish missions had grown Spanish fruits for home use. The first trees came from Spain. The climate of Spain is so much like this part of California that people sometimes say that California has a Mediterranean climate. When the railroad came, the California farmers began to ship some of their fruit to eastern states. This proved to be

Fig. A. Harvesting a crop of honeydew melons in the Great Valley.

popular because these fruits could not be grown in the East. The business grew. The chief wealth of California is not now in flocks and herds, nor in gold nor wheat, but in oranges, lemons, raisins, plums, prunes, pears, apricots, peaches, cherries, apples, figs, persimmons, and other fruits, and in walnuts, almonds, and vegetables.

Not long ago the people of our eastern cities bought prunes, raisins, and oranges from Spain, Italy, and Greece. We now export these fruits *to* Europe.

California fruit growers send out enough oranges to make twelve big trainloads a day for four months of the year, each train having thirty cars.

Fruit centers. The California fruit growers have found that it is a good thing for many people in the same neighborhood to grow the same crop. Everyone in the community will then know how to do the necessary work. The stores will keep the needed tools and supplies.

Most of the plums and very many of the cherries, pears, and apricots are grown in the Santa Clara Valley, which is tucked away in the Coast Ranges south of San Francisco Bay. A long belt of orange orchards is on the slopes that spread out from the foot of the Sierra Nevadas near Bakersfield. When I rode out from Fresno, it seemed that I was in one big vineyard miles in length. Nearly every farmer here grows grapes. Either the grapes are shipped fresh to eastern markets, or dried and made into raisins. It is a common sight to see hundreds of shallow trays containing grapes which are being dried into raisins in the bright warm California sun. Fresno County alone produces over two pounds of raisins for each person in the United States. The peach farmers live a little farther north. Their orchards are so close together that each joins the next for miles and miles. The farmers along the cool shores of Monterey Bay have more than a million apple trees, because the coolness near the sea suits the apple. In two small valleys north of San Francisco Bay, the Santa Rosa Valley and the Napa Valley, hundreds of farmers have orchards of apples and pears, and many also have vineyards.

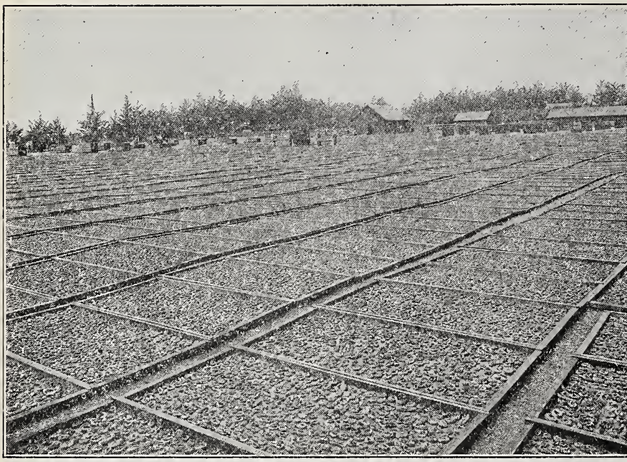


Fig. A. Californians certainly make the sun work for them. In this picture the sun is busily at work drying peaches, which will be boxed and sold as *dried peaches* in grocery stores. Tell some of the things that would result from one good rain a week all summer.

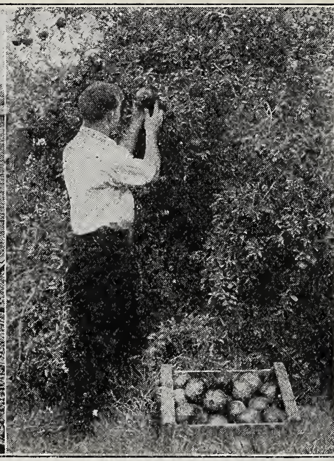


Fig. B. Picking pomegranates in the Great Valley. This fruit is about the size of an orange, of a deep, golden red color, and a pleasant taste.

Californians work together. In each neighborhood the fruit growers usually have a packing house that belongs to all of them. This is called *coöperation* (working together). Fresh fruit that is sent to market is first taken to one of the coöperative packing houses. The manager of the packing house has dozens or hundreds of helpers, who sort and pack the fruit raised by dozens or hundreds of farmers. The fruit is packed in boxes and shipped in carload lots—sometimes whole train loads—to distant markets.

The California walnut growers have an organization that sells the crops for all the growers. One man sells thousands of carloads of oranges. He works for hundreds of growers. The growers have one great organization that advertises for them, sells for them, and does many other things for them. See how many advertisements you can find of foods grown in California. Can you find as many for any other state?

Drying fruit. The summer sun is the best worker on the California fruit farm. The fruit growers dry their peaches, prunes, apricots, and grapes by spreading them on trays set on the ground. If anyone sees a cloud coming, there is a great scramble to take care of the fruit. Everyone runs to pile up trays of fruit, one on top of the other, and to spread a sheet over the top. But this does not often happen. It is the rainless summer that makes California produce more dried fruit than all the rest of the United States. Read the printing on packages or boxes of dried fruit that you can find.

The dried fruit is sorted and packed into boxes which are easy to store and ship. Many millions of dollars' worth of dried fruit goes each year to eastern states, to Europe, and to other continents. Dried fruit keeps well, and for that reason much of it is sent by ship through the Panama Canal.

The dryness of the air makes the flesh of the fruit more firm than the flesh of fruit which grows in moist climates. For this reason, California cherries can be carried to New York or Boston, and California peaches hold their shape remarkably

Fig. A. A young orange tree growing in the Great Valley. How many ripe oranges can you count on this tree?

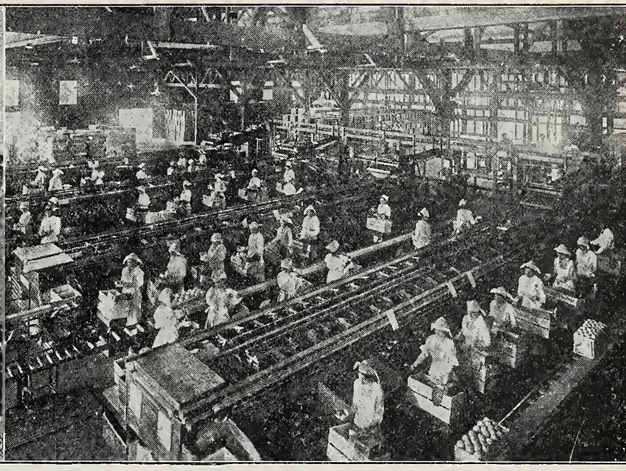


Fig. B. In large packing plants, such as you see in this picture, California fruit is packed or canned for shipment to all parts of the United States and to other countries. The girls in the picture are sorting and packing oranges.

well when canned. Canning fruit is an industry in which California leads all other states.

Vegetables. The soil and weather that are good for oranges and lemons are also good for winter vegetables, and thousands of California farmers grow these crops for eastern markets. Truck farms are scattered all the way from the Imperial Valley to San Francisco and even farther north. One of the great vegetable districts is near the mouths of the Sacramento and San Joaquin rivers, where these streams flow through many miles of swamp. Since dikes have been built to keep out the floods, these marshes make the best of farm land. They are low, moist, rich, flat as a floor, and well suited for truck. In some places one may find a single field containing a thousand acres in which there is only one kind of crop. Each spring carloads of California lettuce, tomatoes, onions, celery, spinach, and asparagus go from these diked lands east of San Francisco to many eastern cities. After the daily market is supplied, hundreds of truckloads are taken to the canneries to be sold finally in the stores of a hundred cities and towns. The canning factory gives weeks of summer work to thousands of women and girls.

Rice. Rice has become an important crop in California. Some of the lowlands near the Sacramento River have been diked and flooded, and rice is grown in the same way it is grown in Louisiana, Texas, and Arkansas.

Harvesting the crops. Who does the work on the fruit and vegetable farms? A farmer can prune and cultivate an orchard, but he cannot pick all the fruit without help. A truck grower can plant and cultivate a field of asparagus or beans, but he cannot harvest the crop with his own hands. When the season of extra work starts on the fruit and vegetable farms in the early spring, a crowd of people pours out of the cities. They walk; they come by train; they come by bus; they come in automobiles — old men, young men, and whole families. Many bring tents, and live for a while by one

Fig. A. Picking cotton in the San Joaquin Valley.

job, then pack up and move on to the next job.

This season of extra work starts in the early spring with cutting asparagus and lettuce, and one crop follows another until the harvest of walnuts and apples in autumn. Some of these people live only two or three months in the town or city in the winter.

Plans for the future. This valley may be made to produce much more than its present rich harvests. But first, more people must be found to buy the crops, and then more water will be needed to make more crops. Reservoirs can be built to store water that now runs away, and canals can be built to carry it to idle land now producing only jack rabbits, horned toads, a few sheep, or a little barley. This can multiply the California fruit crop fivefold, or even more if the fruit is needed. It is fortunate that water to be used for irrigation can often be used for power also. Therefore storage of water for the crops also increases the supply of water for the power plant, and thus the two great industries of agriculture and manufacture help each other.

Comparisons. Compare the Great Valley and the valley of southern California by filling in this outline:

	Great Valley	Valley of Southern California
Latitude of ends		
Length		
Width		
Rainfall		
Temperature		
Crops		
Way of farming		
Principal city		
Source of water		

Going to the right place. Point out, or put on an outline map, the places to which you would go in California: 1. To buy carloads of raisins; apples; pears; plums; cherries; oranges; peaches.

2. To ship fruit by boat to New York.
3. To see people making motion pictures.
4. To see big trees.
5. To see a desert valley; high mountains; low mountains.
6. To see a long aqueduct.

Working together. 1. Tell why it pays the people of California to work together.

2. Tell about "working together" (*coöperation*) in your neighborhood.

3. Explain how it is that one man can or cannot build and operate by himself a big irrigation works. Read pages 323 and 324.

For those who like to do things. Make your own animated map — a rather large one — to show what grows in the Great Valley of California. Show streams, slopes, and alluvial fans also. Or you might make a model of the Great Valley.

For those who like to read. Plan "California Day" for your class or assembly. Tell California's story, by maps, pictures, letters, and talks.

Story of a raindrop. Write a short story of a California raindrop, telling how it went from the sea to the mountain and back again.

Fig. A. A berry field in a river valley near Tacoma. Mount Rainier, also called Mount Tacoma, is in the background. What signs of good rainfall do you see in this picture?

TWO VALLEYS OF THE NORTHWEST

The Willamette-Puget Sound Valley

The Map. On Figure 306-A, find near the Pacific Ocean a long valley that has the Willamette River at one end and Puget Sound at the other. How high is the land near Seattle? near Portland? How high is the land east of Seattle? west of Seattle? east of Portland? west of Portland? What mountains inclose this valley?

A climate that makes man want to do things. Everywhere I saw the pointed tops of evergreen trees all the time that I traveled through the Willamette-Puget Sound Valley. There is more rain here than in the California valleys. The climate is bracing, but not cold in winter. It is cool in summer. The west winds that blow from the Pacific Ocean make it so. If we go to France or southern England we shall again find climate like that of this American valley.

You all know how everyone feels on a very hot summer day. You want to get in the shade and sit still. You also know that in cool weather you are more likely to walk and move about. We like to be active when the thermometer is between 55° and 70°. If the temperature changes a little every few days, we are still more likely to want to move around. That is just the kind of weather that is found in England, parts of France, and in western Oregon and Washington. You want to be out of doors even in winter, and you want to work with your mind and your body.

Roses bloom at Christmas at Portland, Seattle, Tacoma, Everett, Bellingham, and at other places in this region, and pastures are green all the year. In much of this valley, snow at sea level is a curiosity; heavy rain in July or August is rare; thunderstorms are almost unknown, and many people are frightened when one occurs.

Berry land. In this cool climate the orange is unknown, but cherries and plums are at home. Blackberries, raspberries, loganberries, and strawberries thrive so wonderfully that hundreds of farmers grow berries for market. There have been a thousand strawberry pickers in a single

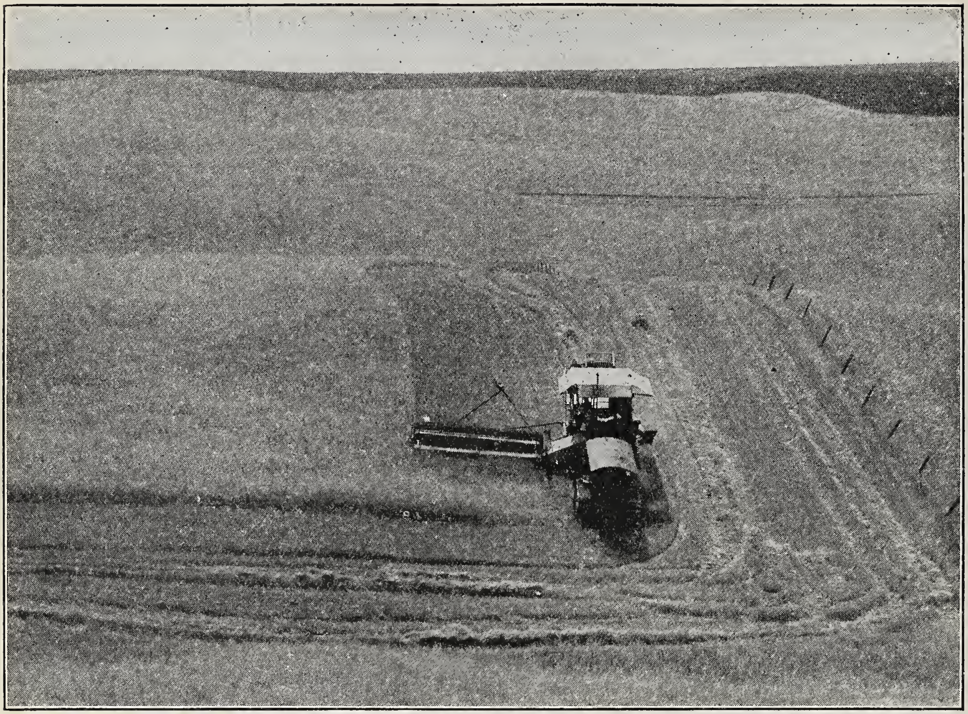


Fig A. Harvesting wheat in the "Inland Empire." The tractor is pulling a *combine* which cuts the grain, threshes it, leaves the straw in the field, and puts the wheat into bags. It would have taken forty or fifty men to do this in grandfather's time.

field in Oregon. The jam factories of western Oregon and western Washington send jars of fruit by the tens of thousands to many states and cities. Some who study this book have had glasses of soda water flavored with fruit sirup prepared in this land of berries.

Rich pastures and heavy crops. Much of this valley is still in forest, but some of it is in farms where potatoes, wheat, and barley give enormous crops, and where rich pastures yield grass every month in the year. We shall study this valley again on page 351.

The Columbia Basin

The "Inland Empire." You can take a train at Seattle, travel for a short time through a land where you can see tall, dark evergreen trees every minute of your journey until the train dives into a tunnel under the Cascade Mountains. The tunnel is eight miles long. When you come out at the other end of the tunnel, you are in a land where the water flows into the Columbia River. This Columbia Basin, or the *Inland Empire,* as it is often called (Fig. 306-A), is a large region where apples, wheat, alfalfa, sheep, and cattle are produced.

The big red apple. Apples are grown on the western edge of the Columbia Basin in three irrigated valleys famous in several continents. The valleys are of the Hood River in Oregon, and the Yakima and the Wenatchee rivers in Washington.

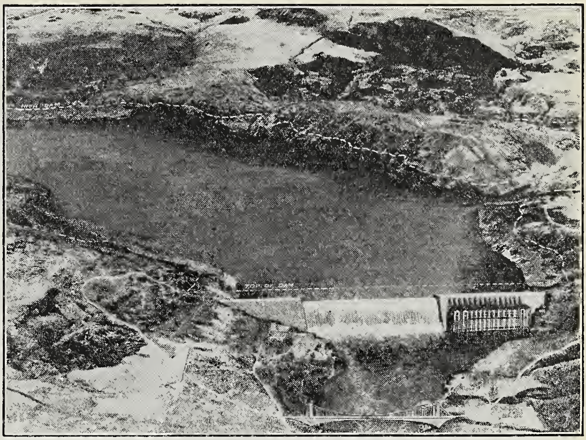


Fig. A. The Grand Coulee Dam and Power Station as it will appear when completed. The big suspension bridge for automobiles and trucks at the bottom of the picture and the roads leading to it give you something by which to measure roughly the size of the dam and the big man-made lake. Grand Coulee is being built to store water to irrigate millions of acres of dry land and to make millions of horse power of electrical energy. The dam is about 90 miles northwest of Spokane, Washington. Locate Spokane on Figure 306-A.

Wheat. Look at the rainfall map of the United States and see what the Cascade Mountains do to the Columbia Basin. Does that map tell you why the farmers of central and eastern Washington, Oregon, and in most of Idaho must irrigate their fields to grow crops? There is one part of the basin where irrigation is not needed. That is on the higher land in southeastern Washington. This higher edge of the Columbia Basin is famous for wheat. A certain farmer had a thousand-acre field on which he grew in one year 46,000 bushels of wheat. This is a very large yield indeed. The average yield of wheat in the United States is only about one third as much an acre. Why do the Washington wheat fields yield so much? Two words give the answer: *volcano* and *lava*.

Once upon a time great volcanoes poured out floods of melted rock, called *lava*, that flowed like water and covered nearly 200,000 square miles of land in the Columbia Basin and the Great Basin which lies to the south of it.

The Snake River canyon. This river, like many other streams in the Columbia Basin, has cut a narrow, deep canyon through the lava. The Snake River canyon is several hundred miles long and 3,000 to 4,000 feet deep. In the walls of that canyon one can see layer after layer of lava rock of various colors, sometimes with the upper edge of one lava flow turned into a layer of soil that was buried by the next lava flow.

Lava soils and why they are rich. The latest lava flow has been on the surface, in most parts of the Columbia Basin, long enough to decay and form a deep soil so very rich that it makes the Washington wheat fields yield more than those of any other wheat region in America. Lava soil is rich because it is fresh, new stuff out of the crust of the earth.

Power from the Columbia. At Grand Coulee on the Columbia River, 90 miles northwest of Spokane, the United States Government began work in 1934 on a dam that will rival Boulder Dam. In 1,650 days the contractors expect to build a dam 200 feet high. It may later be raised to 500 feet. At the dam will be 18 waterwheels, each of 140,000 horse power—the greatest power plant in the world.

Another great power plant is being built where the Columbia River passes through the Cascade Mountains. What may this power be used for?

Look and think. Read from the maps the latitude and the elevation of the Columbia Basin, and tell why the climate is cooler than the climate of the Great Valley of California.

A debate for morning exercises. Would you rather live in the Great Valley of California or in the Willamette-Puget Sound Valley of Washington or Oregon?

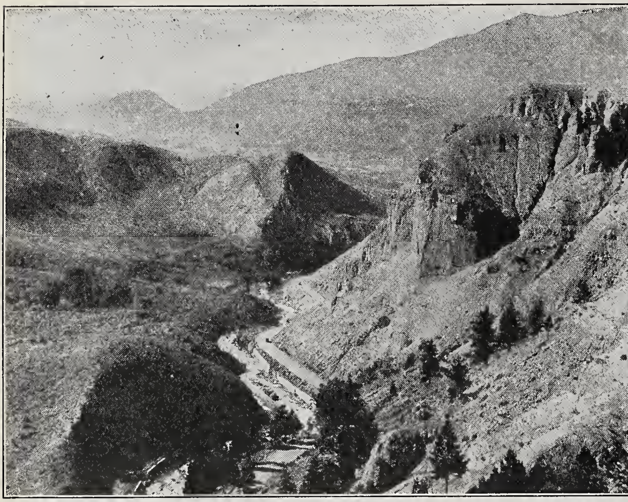


Fig. A. Between the Rockies and the Sierras are mountain lands of little rain, like the one you see in this picture. The Great Basin is a part of this area. What signs of little rain do you see?

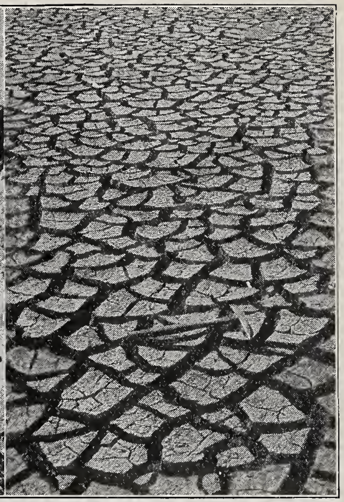


Fig. B. The bed of a Great Basin lake — salty mud, cracked open, and baked hard.

THE GREAT BASIN AND THE ROCKY MOUNTAIN VALLEYS

Streams that do not reach the sea. On Figure 307-A find a dotted line near the Grand Canyon. Trace with your finger this dotted line until it returns to the point from which you started. All the land within the dotted line is called the Great Basin. If you look closely, you will see that no stream flows out of the Great Basin to the sea.

The Great Basin is so called because the mountains give it a rim (Fig. 307-A), and so very little rain falls that no water flows out of the Basin. The Great Basin is larger than half a dozen small states in the eastern part of our country. Death Valley (page 313) is in the southern part of the Great Basin.

Stream work in the Basin. The Great Basin has many flat plains and curious lakes in it. For millions of years the rains have been beating on the mountains in and around the basin, and the running waters have carried the mountain soil down into the Basin and spread it out in wide plains between the mountains. Some of these Basin valleys are now so level that after a heavy rain the water stands in lakes which are only a few inches deep and many miles long. After a few weeks of sunshine the lake becomes a plain of mud which, as it dries, cracks up into cakes that are so hard they ring beneath the hoofs of a horse. In other places there are lakes that have become salty because the streams always carry a tiny quantity of salt and leave it in the lakes when the water dries away. Tell something about Great Salt Lake.

Ranches and rich garden spots. The Basin soils are rich because they have not had the fertility taken out of them by soaking rains or used by the roots of hungry plants. Only water is needed for fertility, and it is furnished in some places by the streams from the Sierras and the Wasatch. The Wasatch waters are used in Utah, and they help the people to make farms in land that was once a desert.

The first irrigation by white men in the United States was started near Salt Lake City by the Mormons. At one place men have dug through the Wasatch Mountains to bring water from a branch of the Colorado River into the Great Basin. This borrowed water flows down and irrigates some of the rich, level plains that stretch away to the westward from the foot of the Wasatch. Water from the Sierra Nevadas is used at the western side of the Great Basin in Nevada. Near Carson City it irrigates several hundred thousand acres of the rich desert soil. These irrigated farms produce large crops of sugar beets, fruit, vegetables, and potatoes, but alfalfa is the chief crop of the Great Basin. Sometimes the alfalfa farmer of Utah or Nevada bargains with his neighbor who has a ranch but no haystack. The ranchman's sheep or cattle then come to the alfalfa farm and spend the winter eating the hay.

Elevation makes the nights of the plateau so cool that not much corn is grown, but the alfalfa and the ranches on the mountains in and around the Basin enable Nevada to have a dozen sheep to every person.

Rocky Mountain valleys. There are many valleys in the Rocky Mountains between New Mexico and the Canadian boundary. Some of them are so high that they are frosty every month in the year and can be used only for summer pasture. Others, not quite so high, have a summer climate that suits lettuce, a plant requiring cool weather and a growing season of only a few weeks. In some Colorado valleys the farmers have coöperative lettuce-packing houses, and send hundreds of carloads of lettuce to distant markets during the midsummer months, when all the lowlands are too hot for lettuce to grow well. Still lower down are valleys where the longer summer lets the farmer grow apples, peaches, or wheat, barley, alfalfa, potatoes, and beets.

Fig. A. The Royal Gorge of the Arkansas River in Colorado. This is one of the narrowest canyons in the world. The cliffs are a thousand feet high. See the suspension bridge at the top of the canyon.

A sand-table model. 1. Model the Great Basin in sand or clay, or sketch it on the board. Show the Basin rim, streams flowing into the lakes, level plains built by rivers, and dried-up lakes.

2. Explain from your map how Great Salt Lake and the good farm lands near it happen to be there.

3. Find some way to show the names of the states that have land in the Great Basin; two cities that have much water; and some cities that have little water.

Five why's. 1. Why does the Great Basin produce cool-land fruits rather than oranges?

2. Why is desert soil so fertile?

3. Why do most people of the Great Basin live at the foot of the Wasatch and Sierra Nevadas?

4. Why can fine lettuce be grown in some of the Rocky Mountain Valleys?

5. Why is *Great Basin* a good name for this part of our country?

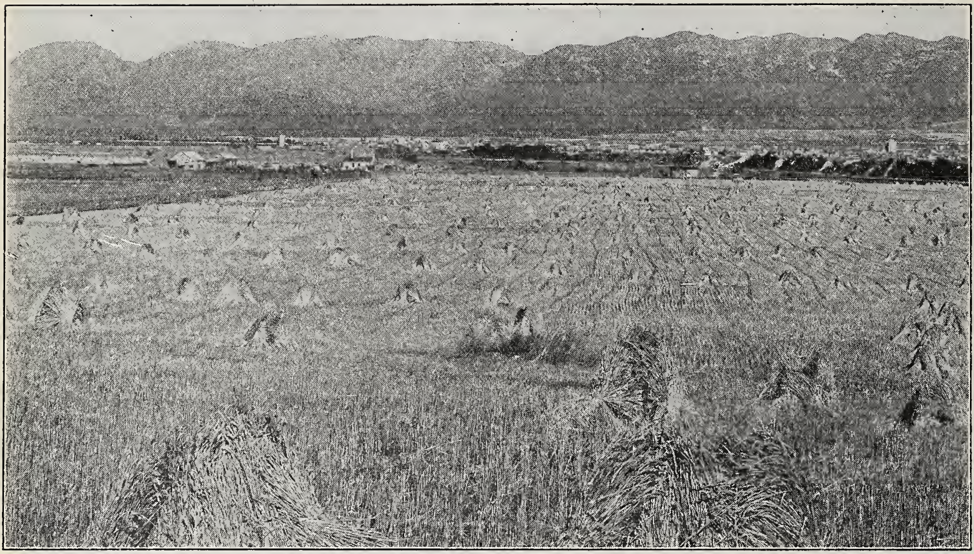


Fig. A. Some mountain valleys are very narrow (Fig. 320-A). Some are wide enough for a town and many farms as in this picture. The town is Polson, Montana. The field in the foreground was planted with wheat, which has been cut and bound into sheaves. Were there mountains behind the man who took the picture?

DRY FARMING AND SUGAR BEETS

Crops where once they failed. Montana has recently become a great wheat-growing state. This is a new thing in the agriculture of the Western States. Farmers once thought that the Great Plains which make up the eastern parts of the Rocky Mountain States were too dry for wheat, but they are now growing it by a process that is called *dry farming.*

One way of doing dry farming is to plow the field one summer and let it lie with no crop at all for a whole year. If weeds start, they are killed by harrowing. By this means, the field spends a year gathering the rainfall, with no plants to use it. A crop of wheat is then planted to grow the next season.

Plant immigrants. In recent years the United States Department of Agriculture has sent plant explorers to search through the fields and valleys of dry countries in Asia and Africa, for plants that have lived in dry countries so long that they can get along with less water than can our own crops. The explorers have brought back from those places the seeds of plants which men have been growing there for a long time. Sorghum and Kafir corn are such crops. Figure 339-A shows a picture of one of them. These new dry-climate crops are a great help to farmers in the drier parts of the region between the Rocky Mountains and the Corn Belt.

The dry-farming land is the higher land of the plains. You remember that the high land of mountains usually has more rain than the low land of the neighboring plains. It is also true that the higher lands of the Great Plains have more rain than the lower lands along the valleys of the rivers that cross the plains. Wheat is the chief dry-farming crop in the higher plain lands of Montana and Colorado. In the southern part, in Kansas, Oklahoma, and Texas, sorghum and Kafir corn lead because they can stand the hot summer and grow with little rain.

Fig. A. Harvesting Kafir corn. This crop of the dry lands makes excellent feed for cattle and poultry.

Fig. B. Hot sun and plenty of irrigation water grow big sugar beets.

Wheat is grown by dry farming on the higher lands near the mountains in central Utah and in the wheat lands of southeastern Washington (page 335).

The iron work horse. Farm machinery has made dry farming possible. If the farmer uses the tractor, the gang plow, and a machine called the combine (Fig. 334-A), the lone man can cultivate much more land than he can with horses.

The machines used in wheat production are made in factories in Chicago and other cities of the United States, and are shipped to our own level wheat lands and to those of Canada, Argentina (South America), Australia, and Russia. The use of machinery has so increased the amount of wheat that is grown in the world that the price of wheat has declined.

Sugar from beets with irrigation. Many plants have some sugar in them, but most of the sugar we use comes from sugar cane (page 272) and sugar beets (Fig. 273-B). Farmers grow sugar beets in many irrigated valleys in the Western States. Which states (Fig. 273-B)? Colorado grows twice as many as any other state. Most of them are grown in the wide valleys in the Great Plains east of the Rockies.

Sugar beets and corn are not neighbors. They do not often talk to each other over the fence. Corn likes hot nights and sugar beets like cool nights. The high elevation of the plateau makes the cool nights that suit the beets. Then the beets suit irrigation because irrigation is costly and the sugar beets yield a large harvest to each acre. What does the sugar map (Fig. 273-B) tell you about rivers?

The beet-sugar factory is a large building; the farmer hauls his beets there or sends them by freight. The beets are put into machines that wash them and chop them in bits. Water dissolves most of the sugar out of the beet pulp. This sugar water is boiled to drive off the excess moisture. The dried pulp is used for cow feed.

Advice to farmers. Give three ways of being successful farmers where the rainfall is less than 20 inches a year.

Map pointing. 1. Show on the physical map where dry farming is carried on in the Great Plains; in Utah; in Washington.

2. Name seven rivers that flow out of the Rocky Mountains, and point them out on the physical map (Fig. 307-A), on the alfalfa map (Fig. 318-B), or the sugar-beet map (Fig. 273-B).

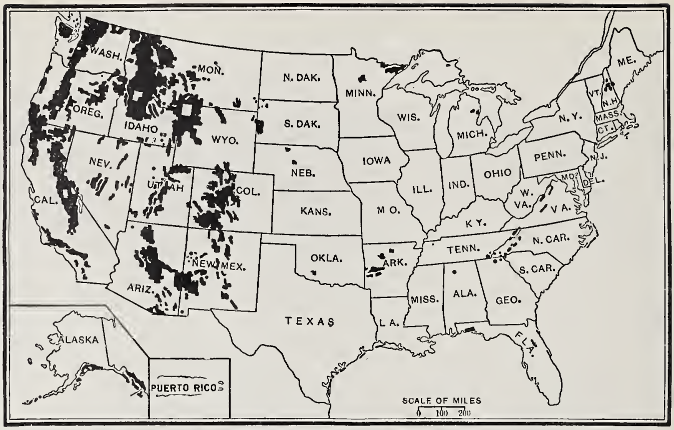


Fig. A. This is a map of the United States, showing our national forests.

Fig. B. At the left is the famous "Grizzly Giant," a redwood tree in Yosemite National Park, California. A picture of a large city church has been placed beside the tree in order that you may better understand how tall this old fellow really is.

THE FOREST, ITS PRODUCTS, AND THE LAND THAT BELONGS TO ALL OF US

Climate that suits trees. Look at Figure 341-A and tell what the picture shows you about the rainfall of that place. What does Figure 323-A show you about the rainfall of the northwestern and southwestern corners of the United States? Along the Pacific coast of the United States the wind blows nearly always from the west. Southern California is too warm most of the year to make the ocean winds give up their moisture before they reach the mountains. But northern California, Oregon, and Washington are cooler, and their mountains are higher and closer to the sea. What is the rainfall there (Fig. 323-A)? The trees on the western sides of the mountains of northern California, western Oregon, and western Washington are dripping with water many days in the year. Trees love moisture. Nowhere in the world do they grow better than on these mountains.

The finest forests. No other part of the world can rival the mountains of the Pacific coast in wealth of lumber supply. You can walk for miles along mountain slopes of California, Oregon, Washington, and British Columbia, winding your way in and out among the trunks of trees that are four, five, six, seven, or eight feet in diameter. The first limb of these trees may be fifty or even a hundred feet from the ground. Nowhere else in the world does one acre of forest yield so much lumber (Figs. 340-B and 341-A).

Large areas of these forests are of trees named redwood, sugar pine, and Douglas fir. The Sitka spruce flourishes in the wettest lands along the coast from Oregon to Alaska. Its strong, light wood has now become important. It is used for parts of airplanes. It is on the west slope of the Sierras that we find the famous "big tree," or *giant sequoia*. Millions of years ago these trees were very common; now they grow only on a few hundred square miles of this region. The largest trees are now in a park (page 341). Some of them have lived since the time of Moses.

From the forest to the lumber yard. Since lumbering is the chief occupation of this region of mountain forests, most of the population is made up of lumbermen who work in the woods, or of people who live in sawmill towns. In the woods they live in camps while working with saws, axes, temporary railroads, log chutes, timber flumes (Fig. 342-B), donkey engines, and teams. The sawmills are usually in the valleys and on the water fronts of Seattle, Tacoma, Longview, and Port Townsend, Washington; Portland, Oregon; Victoria, British Columbia, and other towns. What does the table in the Appendix tell you about the amount of lumber produced in the different states? The lumber is sent by thousands of carloads to eastern cities and by shiploads to every continent except Antarctica.

Forests of the mountains near the North Pacific Coast. The splendid forest that we find in Washington extends into British Columbia and Alaska. Most of the Alaskan shore and many islands, including a part of Kodiak Island, Alaska, are green with forests of Sitka spruce and other evergreen trees. In this northern latitude the timber line is not very far up on the mountains. Above it are thousands of square miles of bare rocks or snow fields from which come the glaciers (page 355).

The Alaskan portion of the Pacific mountain region includes Mount McKinley, Mount Logan, and Mount St. Elias, the highest mountains of North America.

Forestry and the national forests. Since most of this mountain region near the Pacific and also in the Rocky Mountains is too rough for farms, the United States Government has very wisely kept much of the American part of the land as national forests (Fig. 340-A), to be held for the use of all the people for all time. In summer, sheep are allowed to pasture in some of the national forests, for much land within the bounds of the forests has no trees on it. Lumber is cut to meet the needs of the people who live near; but the Forest Service tries to keep young trees growing so that the forests may always yield a harvest. The science of protecting and caring for forests is called *Forestry.* We need to practice it more.

Fig. A. The Redwood Highway in California runs through forests of redwood trees which are among the oldest and largest of living things.

The forest ranger. Hundreds of men, called *forest rangers,* take care of the forests. The forest ranger is a kind of policeman of the forest. He rides over long trails. He climbs over steep paths. He sits in the top of high lookouts peering through field glasses to see if that little speck he sees miles and miles away is smoke or cloud. If it is smoke, he will call someone on a telephone quickly, and then he may join the men who fight the

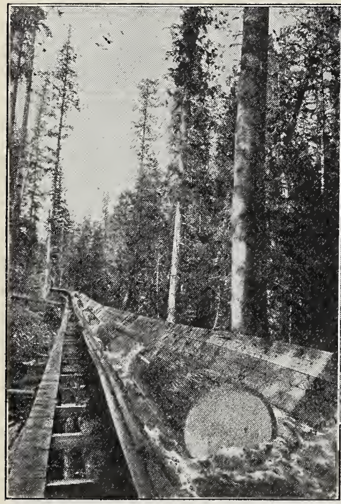


Fig. A. An Oregon Douglas fir ten feet in diameter. The woodman is ready to begin cutting it into lengths.

Fig. B. At the left is a log *flume*. Tell something about the advantages of this system of transporting logs or lumber.

fire. Perhaps he will work with them for two nights and a day without stopping, or until the fire is under control.

Saving our forests. The Civilian Conservation Corps (CCC) has done much work to improve our national forests. These thousands of men have built thousands of miles of *fire breaks* through the forests. Trees and bushes have been cleared away to keep fire from speading and to make the task of fighting fire easier. Thousands of miles of new forest telephone lines, thousands of miles of roads for trucks and automobiles, thousands of *check lanes* in gullies to stop soil loss have also been built; and millions of young trees have been planted.

National parks — more land that belongs to all of the people. Many of the most beautiful parts of the mountain forests of the Western States have been set aside as national parks. In one way they are like school yards or roads or post offices — they belong to everyone. The United States Government keeps them for all the people. No man can own a foot of the land, but everyone may visit the parks and enjoy them. The visitor needs only to obey the rules. Roads have been built in the national parks and travelers may go there to camp, fish, tramp, climb mountain peaks, and enjoy beautiful scenery and the wild outdoors.

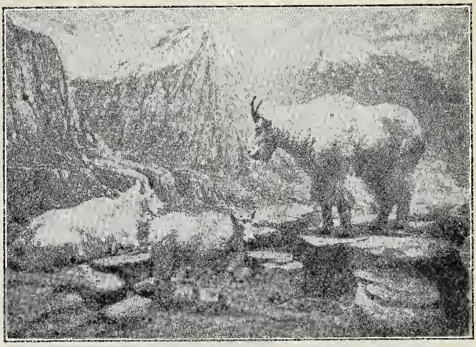
Yellowstone National Park. Find Yellowstone Lake (Fig. 307-A). What is its elevation above the sea? It is in one of the national parks where nature has made many wonderful things. In some places in Yellowstone National Park the rocks beneath the surface of the earth are hot. Because of this, the water in many springs is hot. Some of the springs are boiling. Some of the springs are so deep that the water in the bottom of the spring starts boiling before the water on top boils. Finally the water down deep turns to steam suddenly and blows all the water out of the hole. Such a spring is called a *geyser*. Another interesting sight is Yellowstone Canyon, about one thousand feet deep and beautifully colored. The Yellowstone River tumbles into the upper end of this canyon with a beautiful waterfall.

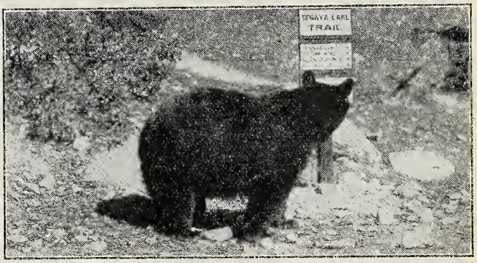
The mountains of the Yellowstone Park are a part of the Rocky Mountain system. This mountain system is many hundreds of miles long and extends beyond the United States boundary into Canada.

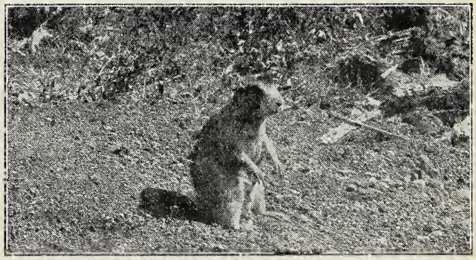
Home for wild animals. Visitors are always interested in the wild animals in the park. No one is allowed to hunt the bear, the elk, the deer, or the buffalo. It did not take the animals long to find out that here man is not their enemy; he is, indeed, their friend. The keepers of the park take care of the animals and sometimes feed them in winter. The bears are the most interesting of all. They come down to the hotels at sunset to eat garbage, and you often see a mother with a cub, both making their supper from pieces of bread and meat that have been left at hotel tables. The traveler must be careful about one thing. He must not leave food in his automobile when he goes away from it. Sometimes a bear will come along looking for something to eat. His nose tells him that there is something good to eat in your car. He is perfectly willing to go into your automobile, eat your bread and meat, lick up your sugar, and, if necessary, tear open your baggage to find what is there.

Many parks. National parks like the Yellowstone have not come without work. Many citizens have spent much time, working without pay, persuading Congress to pass good forest and park laws. Public-spirited citizens had to work very hard to get a grove of the largest of the sequoia trees in California set aside as Sequoia National Park, and afterwards to keep people from cutting the trees for lumber. The beautiful Yosemite Valley, on the Merced River in California, is now the Yosemite National Park.

In Oregon a road eighty miles long has been built so that travelers may visit







Figs. A–D. Some animals of the Western States. Find the Rocky Mountain sheep, black bear, prairie dog, and coyote.

Crater Lake, famed for its high cliffs and clear water of matchless blue. The lake is five miles across and stands in the top

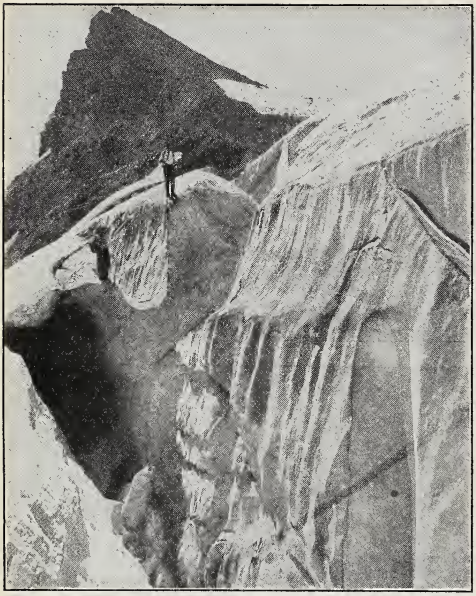


Fig. A. Climbing over the glaciers in Rainier National Park is thrilling sport as you can readily see.

of an old volcano, where once the lava boiled and bubbled. In western Washington is Mount Rainier National Park, preserving the beautiful flowers and forests around snow-capped Mount Rainier. The northernmost part of the Rocky Mountains in the United States has become Glacier National Park. It contains many beautiful lakes and is a fine place for a summer vacation. Rocky Mountain National Park is in the mountains of central Colorado. While not in any park, Pikes Peak, nearly three miles above sea level, is undoubtedly the most famous of Colorado mountain peaks. You may find a snowstorm there any day in summer. An automobile will take you there easily, and thousands of people from all parts of the United States make the trip every summer.

The government of Canada, like that of our own country, has made several large parks in its part of the Rocky Mountains and the Cascades.

How big are the trees? 1. Measure, on the floor or playground, circles 4 to 8 feet in diameter. Let children join hands around the circles.

2. Find flagpoles or buildings 50 to 100 feet high. Use these circles and buildings in describing the size of western trees.

3. What do Figures 312-A and 342-A tell you about size of trees in different places?

A map for forest lands. Pass your hand over the rainy mountains near the Pacific Ocean.

1. List the states and the provinces of Canada over which your hand passes.

2. Shade this region on a blank map.

3. Place initials on the map where the following places are located: Kodiak Island (Fig. 456-A); Juneau; Mount McKinley; Mount Logan; Mount St. Elias; Seattle; Tacoma; Portland; Longview; Yosemite National Park; Sequoia National Park; Crater Lake; Rainier National Park.

4. Put on the map all of the national parks that you can find in the Rocky Mountains.

Kinds of mountains. 1. Look at Figure 279-A and at Figure 305-A. One shows a mountain so old that it is worn down and rounded. We sometimes call such mountains *old mountains.* The sharper, higher mountains have not yet been worn down. We call them *young, rugged mountains.* Their tops are often made of bare rock. If high enough, they are covered with snow. After many, many years — very many years, indeed — they, too, will be worn down. You must not think that mountains do not change. Would you choose old mountains or young mountains for your summer vacation? Which would a railroad builder choose if he were looking for an easy line to build?

2. What covers the top of the mountain shown in Figure 333-A? After this snow has lain on the mountain for a few years, it packs itself together, becomes solid ice, and slowly creeps down the mountain. We call it a *glacier.* There are some under the snow in this picture.

Use new words in sentences. Use each of the following words correctly in sentences: log chutes, timber flumes, donkey engines, Forest Service, forestry, forest rangers, national parks, glacier, old mountain, young mountain.

Diaries. Write the diary that might have been written by:

1. a forest ranger;
2. a lumberman near Seattle;
3. a big tree.

Fig. A. A snapshot of Mother and Father Salmon going upstream never to return.

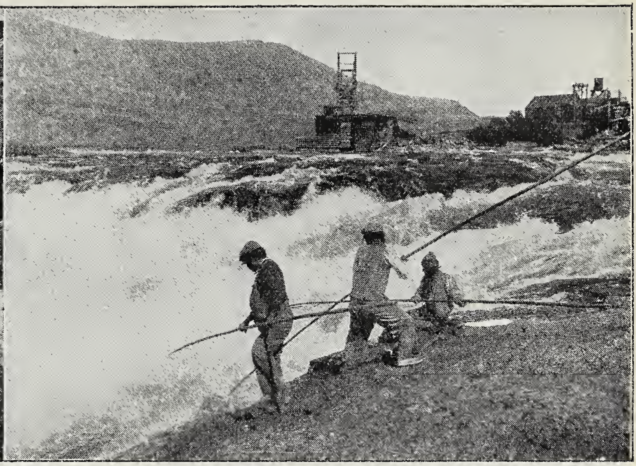


Fig. B. For unknown generations certain Indian families have had the right to spear salmon from certain rocks like this. See the big salmon.

THE PACIFIC SALMON

The sea salmon. Mother Salmon keeps her eggs in ice water and she has large families of children to grow up and be food for the sons of men. Mother Salmon is a fish that spends most of her life in the salt sea, but she lays eggs in *cold, fresh* water in a place far from the sea. In the summertime it is hard to find such water, but Mother Salmon knows where to look. There is cold, fresh water high up in the mountains where streams flow down from melting snows and glaciers. Sometimes these streams are a thousand miles from the sea. It is a long, hard journey for a fish to go a thousand miles up a river to a little stream or lake in the mountains, but that is where Mother Salmon has to go to lay her eggs.

Salmon take a long journey. In the summer a great number (*school,* we say) of big, fat salmon swim from the Pacific Ocean up every river on the coast, from San Francisco to the Arctic Ocean, and also on the cold coast of Asia. In one river they swim around a certain island near its mouth, and two miles up they cross over to the other side, as carefully as a man driving a wagon would follow the road. In that river they follow that path every year. Upstream they go — on and on. They swim through rapids. They jump up waterfalls (Fig. 345-A). Sometimes they fall back and are cut by the rocks and some are killed. White men catch them; Indians catch them; bears catch them; wild cats, hawks, and eagles catch them. Those that live become thin, but still they swim on! At last, after many weeks, Father and Mother Salmon reach the mountain streams. There the Mother Salmon lays her eggs. The parent fish then die. None of the old salmon of some varieties ever go back alive to the ocean.

The little salmon go to the sea. The little salmon go back to the sea at the end of the first summer. When first hatched, salmon are no larger than little pieces of match sticks. They have a rather hard time of it as they work their way downstream, and many are caught and eaten by river fish. Many go off into

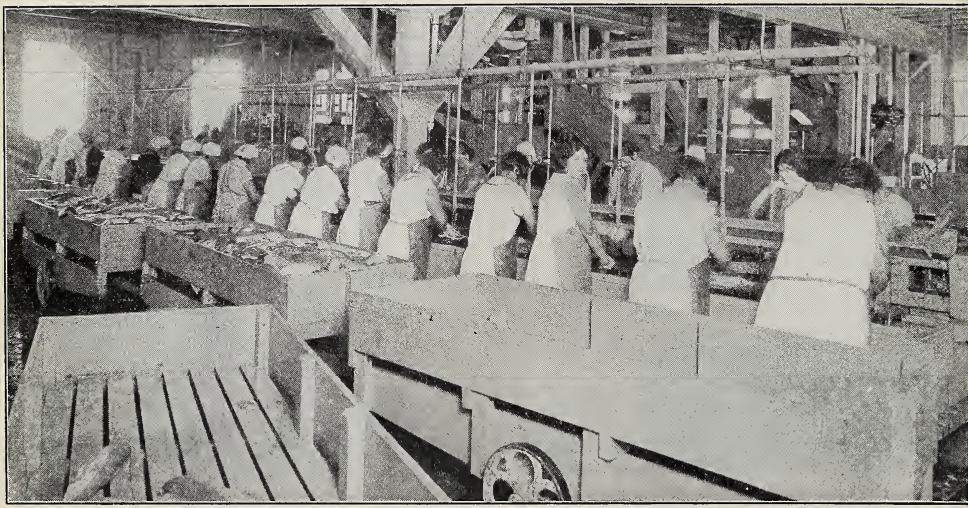


Fig. A. Cleaning salmon before they are canned. See the trucks full of fish.

irrigation ditches and perish on the dry ground of the fields. Those that reach the sea, months later, have grown to be about as long as your finger. No one knows where they go. But in a few years they have become as long as your arm, and then they join the great school and swim back up the river where they were born, as Mother and Father Salmon did before them.

The Indian smoked salmon. The Indians in Washington State, British Columbia, and Alaska go out in their canoes and in a short time spear enough to fill a boat. It is easy to catch the salmon when they come in such crowds. Indians of British Columbia and Alaska dry the fish by smoking them over the campfire. Some they put in a *cache* (pronounced *cash*), which is a little wooden house on poles. Here they are safe from dogs and wolves. The Indians may go off berry picking and deer hunting in the late summer and early autumn. The Indians of the interior must have dried salmon for themselves and their dogs. Very often there is nothing else for them to eat in winter, and they could not live but for the yearly run of salmon.

Canned salmon. White men have learned how to keep salmon fresh and good in tin cans. Canned salmon is much better than is the Indian's smoked salmon, which is said to taste like an old shoe. There are large fish-canning factories on Puget Sound and the Columbia River, on smaller rivers in Washington, Oregon, and British Columbia, and on the Yukon and other rivers of Alaska. In summer for a few weeks, during the run of salmon, the factories are busy, but they are closed the rest of the year, and often only watchmen remain in winter. On the Bering Sea shore of Alaska it is too cold for farms, and in British Columbia and southern Alaska there is very little good farm land near the sea. At Juneau and at the mouth of the river Skeena the shore is so mountainous that there is barely enough level land for buildings to stand on. Therefore, at salmon-canning time, a ship loaded with workers and tin cans sails up to the

cannery. In a few weeks the ship sails away with a load of fine canned salmon. It is one of the chief products of Washington, Oregon, Alaska, and British Columbia, and it is sold in most grocery stores in the United States and in many foreign countries. What addresses have you read on the labels of salmon cans?

Raising little salmon. Men have learned two very interesting and useful things about salmon. One is that the big fish come back from the sea and go up the rivers where they were born. The other thing is that men can now raise salmon as easily as we raise pigs or chickens. The eggs are taken from the bodies of the Mother Salmon at the hatcheries and put into troughs of cold water. After the fish are hatched, they are kept in ponds and fed all summer and then let loose to go out to sea, where they grow big before coming back to be caught. The United States government operates many fish hatcheries so that the people may have more fish to eat. The Bureau of Fisheries at Washington, D. C., has learned men who spend their time studying the habits of fishes. Through this study they learn how to raise more fish. The men in the fish hatcheries also send out buckets and cans of clean water in which are thousands of little trout, bass, and other fish to be put into the fresh-water streams of the land.

Fish farmers in other lands. The people of China, Japan, and Europe are also very expert at rearing fish as a crop. Many have been doing it since long before Columbus discovered America.

Some of the salmon of the North Pacific Ocean go up the rivers of Asia; and since the art of canning fish has been discovered, the people of Japan have built canning factories along the northernmost islands of Japan and the coast of Kamchatka.

Fig. A. "That salmon is taller than I am."

Make a motion picture. "The Life of Mother Salmon." Draw scenes in the life of a salmon, and mount them to make a motion-picture show. Here are some titles for scenes in your movie:

Mother Salmon goes up a ladder;
Mother Salmon escapes from the hawk;
Mother Salmon escapes from the fisherman;
Mother Salmon keeps her eggs in ice water;
A young salmon's dangers;
Little salmon go to sea;
The school comes home;
Salmon make a meal for Indians;
Salmon make a meal for fish hawks;
Salmon make a meal for us.

Of course, you will need lecturers to explain your movie.

A salmon map for your movie. Your map will have to show the Pacific coasts of Asia and North America. Here are some places you will need to show on your movie: Puget Sound, Columbia River, Washington, Oregon, Fraser River, Yukon, Alaska, British Columbia, Bering Sea, Juneau, Japan, Kamchatka. Why does each of these places need to show on your map?

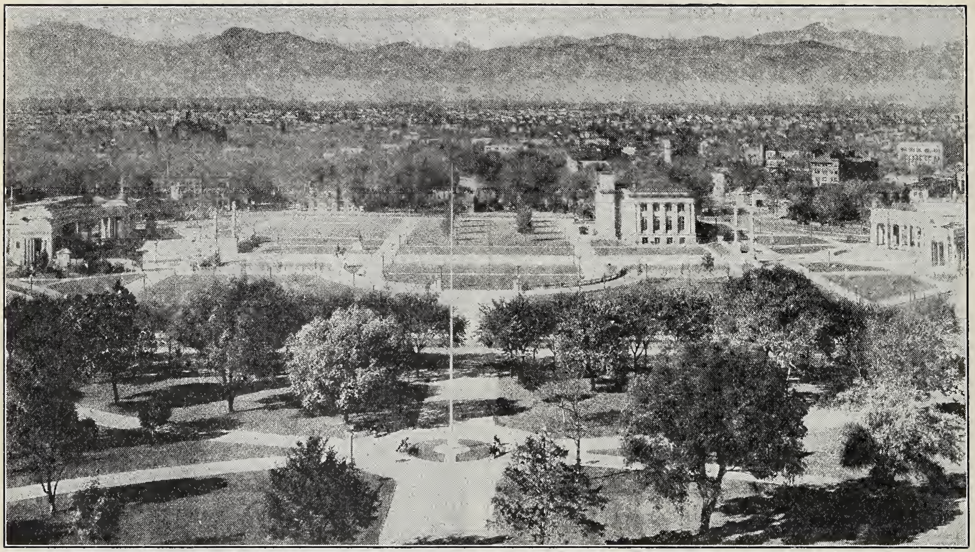


Fig. A. You are looking from the steps of the State Capitol at Denver, Colorado, across part of the city to the Rocky Mountains. They call this part *The Rocky Mountain Front.* Find the *Continental Divide* on Figure 307-A.

CITIES IN THE WESTERN STATES

What makes a city? We found out about that on page 293. The Western States have several kinds of cities. We read about the mining towns on page 316.

Irrigation towns. Greeley, Colorado, is in the irrigated valley of a river. What is the name of the river? Summer snow melts along the headwaters of that river and the water is led by canals to hundreds of farms, where the farmers grow many things, but mainly alfalfa, potatoes, and beets. Because the mountain snow stores water, the farmers can send thousands of carloads of potatoes out of the Greeley district every year to cities far away to the eastward, and Greeley is the chief center for buying and selling in this valley.

What are some things which might greatly affect the future growth of Greeley? of Leadville (page 316)?

There are many irrigation towns in the Western States: Phoenix, Arizona, on the Salt River; Yuma, Arizona, on the Colorado River; Carson City, Nevada; Yakima and Spokane, Washington; Missoula, Montana; Salt Lake City, Utah; Carlsbad, New Mexico; the cities on the Snake River, Fresno, and many other fruit centers in California. These and many other smaller cities are each the business capital of a little kingdom of irrigated lowland, with ranches on the higher, drier land round about.

How would you use the words *intensive agriculture* (page 325) when talking about these irrigated valleys?

Mountain gateway cities. Denver grew up at the edge of a mountain where several valleys come together and where roads from many mining camps lead down out of the mountains. People can reach this gateway city from many directions. They go there to sell produce and to buy supplies. Denver is the largest mountain gateway city in the Western States; others are Salt Lake City, Utah; Colorado Springs

and Pueblo, Colorado, with its smelters; Spokane, Washington; Helena, Montana. From far and near, people in towns, villages, fruit farms, cattle ranches, sheep camps, lumber camps, mining camps, construction camps, vacation camps go or send to these gateway towns to get things, or they send mail orders to have things sent out to them by mail, express, or freight. Goods come to the gateway cities and other distributing centers in carload lots from factories, wholesale stores, and ports. They go out in small parcels.

There may be more than one reason why a city grows in a certain place. The more reasons there are for a city, the larger the city may become. Many of the gateway cities are also irrigation towns. Salt Lake City has another reason for being a city. Much ore is brought here to be smelted. Helena, Montana, also has a smelting industry, and so has El Paso ("The Pass"). This city is in Texas, with irrigated lands around it, but it smelts ore from New Mexico and trades with a large area.

The port cities. Ships carry freight more cheaply than can railroads and motor trucks. If ships can reach a city, it may grow to great size. Cheap transportation by water is the chief reason why the port cities of the Western States, like the port cities of other states and most other countries of the world, are larger than the inland cities.

The Western States have four great seaports: Los Angeles, San Francisco, Seattle, and Portland. Each has a good harbor, many steamship lines, a great trade, and a very good climate.

Los Angeles. You would enjoy being out of doors in Los Angeles most of the time. Mild climate has made the city a health and pleasure resort and a city of homes. Tens of thousands of people who have retired from active work in the colder parts of the country go to live for the rest of their lives in Los Angeles and its many suburbs and surrounding towns.

We have already found (page 326) that, because of the pleasant climate and varied scenery, Los Angeles has become the greatest center in the world for the motion-picture industry.

How much has the population of Los Angeles grown? Has it grown faster than Chicago, Boston, New Orleans, and some other cities (see Appendix)? Pleasant winter climate, the motion picture, the steamship lines have not done it all. Los Angeles is a good place for manufacturing many things besides motion pictures.

Petroleum. Oil has helped to make the cities of California grow rapidly. Southern California has several oil fields. They have yielded so much oil that California has been one of the leading oil states for many years. This means that the railroads and factories of Los Angeles, San Francisco, and almost every other California town can run their engines as cheaply as though they were beside a coal mine in Alabama or Pennsylvania. Manufacturing is increasing rapidly. We might almost say that Los Angeles outgrew itself, because it outgrew its water supply.

Los Angeles solves her water problem. Years ago the people of Los Angeles saw that the city must have a larger water supply. Through 250 miles of desert and mountain country, a great aqueduct was built from the Owens River, near the foot of Mount Whitney, to the city. This river is fed by lakes and from the melting snows in the Sierra Nevadas. Power plants have been built at points where the aqueduct comes down the mountain sides. The power is carried to the city by wire and sold to help repay the cost of building

Fig. A. The city of Seattle as seen from the air.

the aqueduct. Los Angeles, however, and the smaller cities near by have grown so fast that an even larger water supply must be obtained. A second large aqueduct will bring water from a point in the Colorado River (Fig. 306-A), about 150 miles below Boulder Dam, to a number of southern California cities.

San Diego. San Diego, a neighbor of Los Angeles, has one of the finest harbors in the world, a growing trade, and a winter climate in which there is very little frost indeed. Like Los Angeles, San Diego has gone back into the mountains and built the Morena Reservoir to supply the city with fresh water.

Pasadena. In Pasadena, another neighbor, many lovely homes are found. Each winter Pasadena has a great winter Festival of Roses, which is something like the Mardi gras of New Orleans.

The trade of San Francisco. This city stands at a gate, a sea gate, called the Golden Gate. Is there any other opening between Mexico and the Columbia River by which ocean ships can sail through the coast ranges? This is the natural place for the trade to go in and out of the Great Valley of central California and the lands that lie to the east of it. Across the bay from San Francisco are Oakland, Berkeley, and Alameda. These cities share the broad, well-protected harbor, but most of the ships dock on the San Francisco side of the bay.

How many people live in the cities on San Francisco Bay (Appendix A-11)? The answer will surely surprise you. Many railroads center there, and steamship lines reach out to Asia, Alaska, Australia, and South America. Lines of steamers go from San Francisco and other bay cities

through the Panama Canal to the eastern states and to Europe. San Francisco, Los Angeles, and Seattle are rivals because each city wishes to be the leading port of the Pacific coast.

The Panama Canal. Before the Panama Canal was built, steamships brought Asiatic goods to Pacific ports to be put on trains there and sent across the continent. Now the goods from Asia sometimes stay on the ship and are carried by way of the Panama Canal to the Atlantic ports. The canal has taken away some trade, but it has given more because it gives the people of the Pacific coast a cheap way to market their produce in cities on the Atlantic.

Climate and manufactures in San Francisco and the bay cities. San Francisco and the near-by bay cities build ships and make much machinery for California industries. Their manufactures are steadily increasing in variety. Their manufactured goods for export have been chiefly those things for which the native materials of California may be used, such as articles of wood; meat; canned, dried, and preserved fruits and vegetables; and canned fish.

The climate of San Francisco is a great aid to manufacturing. The water in the Pacific Ocean off the Golden Gate is very cold in summer because the current along that coast comes from the north. The west wind, cooled by this current, blows into the city, making it so cool that you may wish to wear an overcoat at three o'clock in the afternoon, when the thermometer is 100° a short distance away in the Great Valley. With such a bracing temperature, even a lazy man almost likes to work. If it is very hot or very cold, even an industrious person cannot do as much as he would if he liked the temperature better.

Seattle and Portland. Look at the map (Fig. 306-A) and tell what Nature did to make it easy for Seattle and Portland to be the chief ports of our north Pacific coast. The many branches of Puget Sound make many deep harbors. Tacoma, Everett, and Seattle all have good places for shipping, but Seattle is the largest port. If you wish to go from the United States to Japan by the quickest route, you sail from Puget Sound. From Seattle, as from San Francisco, many lines of steamers reach many countries. Many fast trains leave Seattle and go over the mountains to St. Paul and Chicago, and on to the eastern seaboard.

Large ocean steamers also go up to Portland. This city has a natural gate by which trade can reach the interior. It is the narrow valley or gorge that the Columbia River has cut through the Cascade Mountains. This is useful because it lets the railroads come down the valley carrying goods to Portland's ocean ships. A canal has been built so that river steamers can go far into the Inland Empire. The gorge is really a great canyon with forested walls and waterfalls tumbling down into it. At its bottom the great river winds through forested rocky islands. Thousands of travelers go through the gorge every year to see its beauty. They may make a three-cornered trip from Portland through the gorge, up the Hood River Valley to snow-capped Mount Hood, and back across the mountains.

The railroads of Seattle, having no such natural gate, have recently built a costly tunnel (page 334) under the Cascade Mountains, in order to reach the Columbia Basin without a hard climb. The cost of living is low in Portland. This helps to make it a good place for manufacturing. How do you explain the low cost of living?

The lumber of the Northwest. The mountains on both sides of the valleys in

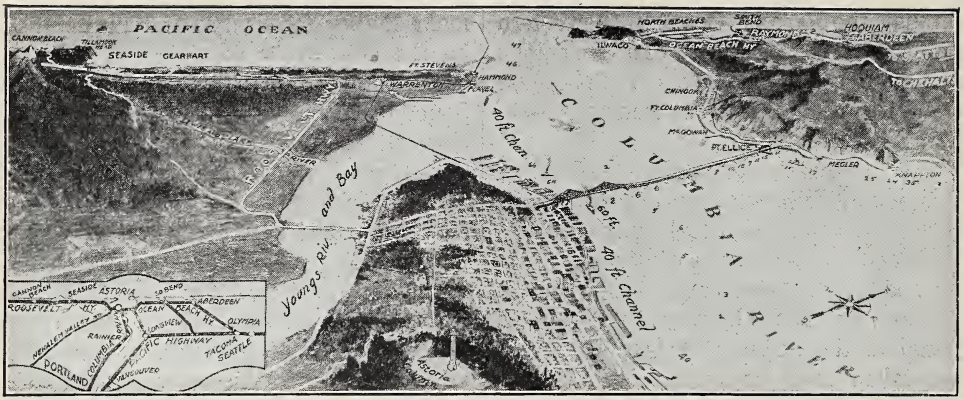


Fig. A. The city of Astoria, Oregon, and vicinity. This picture shows us how the mouth of a river looks. The mouth of Young's River is a nice safe harbor protected by the point of land.

which Portland and Seattle stand are buried deep beneath the dark shade of wonderful forests (page 340). Forests still cover part of the valley floor. Trainloads of logs come down the winding roads from the mountains and are dumped into the water ready for the lumberjack to float them around to the door of the sawmill. Log rafts float upon the bays and rivers. Seattle, Tacoma, Portland, Everett, Bellingham, Victoria, Vancouver, and many smaller towns have big sawmills.

Water power. The mountains of western Oregon and Washington have much rain and snow. The streams have water all the year. Look up the meaning of the word *cascades,* which is the name of a mountain range. There is more water power per person here than in any other part of the United States. This promises a great future for manufacturing in the cities of western Oregon and Washington.

"*Match me*" *game.* Following are two lists: a list of cities and a list of reasons for their growth.

Divide the class into two teams, or work in small groups of two or four. A child from one team says, "Los Angeles"; a child from the second team must find the reason for Los Angeles' growth.

List 1: Cities

Alameda	Bellingham
Berkeley	Carson City
Colorado Springs	Denver
Everett	Greeley
Great Falls	Helena
Hollywood	Leadville
Los Angeles	Oakland
Portland	Phoenix
Pueblo	Pasadena
San Francisco	Spokane
Salt Lake City	Seattle
San Diego	Tacoma
Victoria	Vancouver
Wenatchee	Yuma

List 2: Reasons for their growth

Buying and selling farm products from irrigated valleys
Mining
Mountain gateways; buying and selling because roads meet from many directions
Smelters for mining regions
Port cities
Climate pleasant for health and recreation
Manufacture of motion-picture films
Export lumber
Varied scenes for motion pictures near by
Oil for engines and factories
Trade through Panama Canal to Atlantic
Trade with countries across Pacific
Builds ships and makes machinery
Manufactures native materials
Climate makes people want to work
Beautiful scenery attracts tourists
Coast has good harbors
Sawmills; lumber manufacture

Map game. On a blank political map of the United States, let the two teams place the cities in the above list; score as above.

SOME THINGS FOR THE FUTURE

Looking ahead. The Western States can have a great increase in wheat and in the products of irrigation—fruit, vegetables, beets, and alfalfa. They cannot expect to pasture more animals than they now do, for all the pastures are full and some are being injured by overgrazing. The forests are being injured by fires, and the lumbermen are cutting trees faster than trees can grow. With careful fire protection, much more lumber can be grown. Gold and silver have already declined. Copper and oil may be expected to do the same. But there are four huge mineral resources that may keep thousands of workers and scores of towns busy for a long time; they are phosphate rock, oil shale, potash, and coal.

Phosphate rock. By far the largest store of phosphate rock that men know of is scattered about in the mountains and plateaus near the place where Colorado, Utah, and Wyoming meet. This is sure to make a great industry some day.

Oil shale. Northwestern Colorado and some other parts of the Rocky Mountain region have great oil deposits, but many years may pass before they are used. This oil does not spurt out of wells, but is scattered through shaly rocks very much as juice is through an apple. To get the oil, the rock is quarried and then heated. The heat drives off the oil.

Potash. For years men have been boring wells in western Texas and New Mexico hunting potash, one of the most important foods for plants. They have found it, 1,000 feet down, in southeastern New Mexico. We produced 107,000 tons in 1929 and 275,000 tons in 1934. More mines are being opened.

Coal. What does Figure 290-A tell you about coal fields in the Western States? The great coal field of Montana and Wyoming lies in flat layers beneath the earth and rock layers of the Great Plains. There is some coal in the mountains, too (Fig. 290-A), but there is not nearly so much as in this great deposit of the plains.

Soil erosion control. The future of the Western States may also be affected by the work which the Soil Erosion Service of the United States Government is doing. While this work is being carried on in most states, the largest projects for soil erosion control are in the Western States.

The purpose of the soil erosion work is to show how land should be treated and used so that the fertile topsoil may be saved, that water may be kept in the ground, that floods may be controlled, and that the land may be used at a profit for as long as it is operated.

There is great need for such work. The United States Government says that the direct cost each year to the farmers of the country is at least four hundred million dollars in soil values lost through erosion. This does not count the cost of floods, or the loss caused by the filling in of great reservoirs and rivers with silt.

The largest soil erosion control project is the Navajo Indian Reservation project in Arizona and New Mexico with about 16,000,000 acres involved. The second largest project is the Gila River project in Arizona and New Mexico with about 8,000,000 acres.

Debates. 1. *Resolved:* That it makes no difference to the people of a city on the Atlantic coast if fires and lumbermen waste timber on the Pacific mountains.

2. *Resolved:* That our forests are more valuable than our gold mines.

A letter. Write a letter from a man in Idaho telling why he is in the sheep business, rather than growing cabbages and onions.

Using pictures. Use the pictures in this book to answer this question: "How are people using the land in the Western States?" See how many good answers you can get.

Fig. A. Each of the big tractors in the picture is pulling four *listers*. A lister is a farm machine which digs a furrow, plants grain, and covers it all at one time. The listers in the picture are planting twenty-four rows of corn at once, or twelve acres in an hour.

THE NORTH CENTRAL STATES

LAND OF BREAD AND MEAT, OF BUTTER, IRON ORE, AND WHEELS

As you study this chapter, make notes to answer this question: What would happen to the rest of the United States if the North Central Farming Region were covered by the sea?

LEVEL LAND AND GOOD CLIMATE

John Marvin's farm. John Marvin is a schoolboy who lives on a farm in the Corn Belt, near latitude 42° north, longitude 92° west. When you walk about the Marvin farm, you will see that the soil is almost as black as your shoe. It is soft under your feet. If you happen to feel like throwing a stone, you might hunt all day, but you would not find a stone as big as an egg on the whole farm.

Although the land on the Marvin farm has gentle slopes, it is so nearly level that all kinds of farm machinery can be used on it. Perhaps you think that this land was always as level as you see it now. Not at all. There were hills here at one time, but a great mass of ice, called a *glacier*, did much to level the Marvin farm and thousands of other farms in Ohio, Indiana, Illinois, Iowa, and other North Central States. The great glacier moved slowly southward, perhaps only a few inches a day. It started in the cold north and pushed its way across southern Canada, across the Great Lakes, out across Michigan, Wisconsin, and the states to the south of them. On Figure 355-A you can see exactly how far south it came. There were several of these great ice sheets. Some of the country was hilly before the glacier came, as in Figure 279-A. The glaciers scraped off the hilltops and pushed the material into the valleys between the hills. This left the land level, like Figure 354-A. It was a fine thing for the Marvin family, and for thousands

and thousands of other families, that the glacier went over their land. Level or gently rolling farms can be found for a long way to the north of the Marvin farm, and for a long way to the south, to the west, and to the east of it.

Look at Figure 355-A, which shows the size of the region that the glacier smoothed. Put your finger on the city of Chicago. You can ride from Chicago for a hundred miles in several directions and never see a hill as high as a two-story house. Indeed, the glacier improved so much good farm land that it has helped greatly to make the United States the richest country in the world.

Corn Belt climate. Besides rich, level land, Nature gave this region a climate good for crops. The summer is warm, and plants like heat. The sun shines brightly, and plants like sunshine. There are many days when rain falls in showers during the growing season. These conditions suit corn, for corn is a plant that requires heat, sunshine, and moisture to make its tall stalk and large ears of food for man and beast.

Look at Figure 359-A and be ready to tell why the Corn Belt may be called the heart of the Central Farming Region. There are different kinds of land all around it, as we shall soon see, but the level Corn Belt land covers more of the surface of these states than any other kind of land.

Settlement and roads. When John Marvin's great-grandfather came to Iowa from Michigan in 1855, all the land near the Marvin farm was a grass-covered plain, or *prairie,* as they then called it. There was not a tree anywhere (Fig. 354-A), and there were no farms, only gentle swells of land covered with grass. At that time, government surveyors surveyed the prairie and marked places where roads were to be made. They decided to make the

Fig. A. This map shows the part of North America which was covered by the ice sheet or continental glacier. What states were changed by the ice sheet?

roads a mile apart and in a straight line from east to west and from north to south. The roads divided the land into square blocks containing one square mile. The surveyors also cut each square mile into four equal parts, called *quarter sections,* containing 160 acres. Quarter sections were given free to settlers who would go there to live and to cultivate the land. John's great-grandfather took a quarter section, built a house, and cultivated the soil. John's grandfather lived in the same house and tilled the land, and now John's father lives on the same farm.

As people came from Illinois, Michigan, New York, and other eastern states and settled the new country, they usually made townships of an area that was six miles square. Perhaps you can find out how many square miles are in such a township. How many quarter-section farms? how many acres?

The map. Trace or draw an outline map of the North Central States. Put on it the bounds of the Corn Belt from Figure 359-A. Make a cross to show where John Marvin's farm is. Trace on this map the southern-

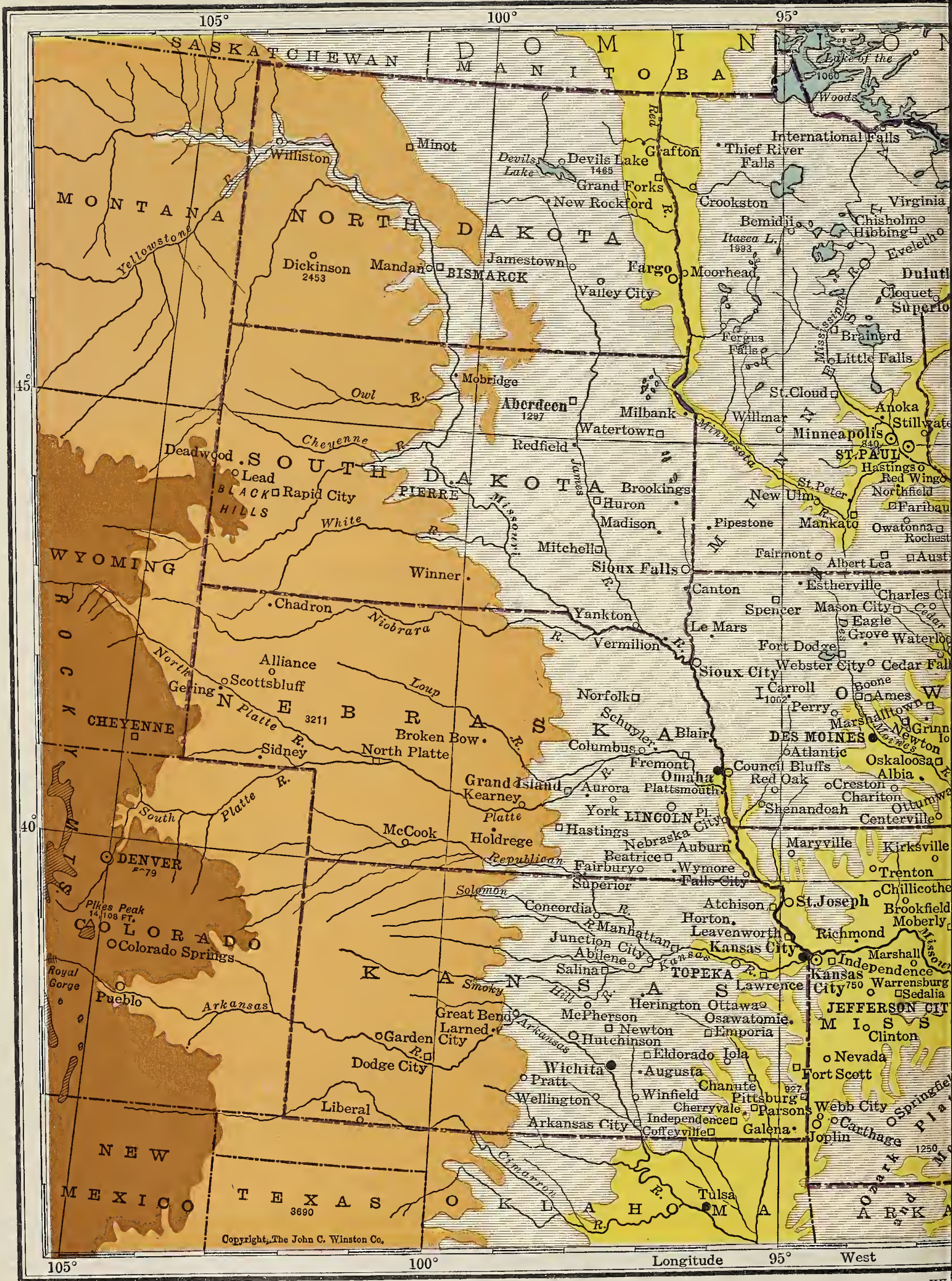

M
N
O
P
1
2
3
105°
100°
95°
45
40
105°
100°
Longitude
95°
West
D O M I N I O N
SASKATCHEWAN
MANITOBA
Lake of the Woods
1060
MONTANA
Yellowstone
Williston
Minot
NORTH DAKOTA
Devils Lake
Devils Lake
1465
Grafton
Grand Forks
New Rockford
Red R.
International Falls
Thief River Falls
Crookston
Bemidji
Itasca L.
1993
Virginia
Chisholm
Hibbing
Eveleth
Duluth
Cloquet
Superior
Dickinson
2453
Mandan
BISMARCK
Jamestown
Valley City
Fargo
Moorhead
Fergus Falls
Mississippi R.
Brainerd
Little Falls
St. Cloud
Anoka
Stillwater
Minneapolis
840
ST. PAUL
Hastings
Red Wing
Northfield
Faribault
Owatonna
Rochester
Austin
Albert Lea
Mobridge
Owl R.
Aberdeen
1297
Milbank
Watertown
Redfield
Cheyenne R.
Deadwood
Lead
BLACK HILLS
Rapid City
SOUTH DAKOTA
PIERRE
Missouri
James
Huron
Brookings
Madison
Pipestone
Mitchell
Sioux Falls
White R.
Winner
Willmar
Minnesota
St. Peter
New Ulm
Mankato
MINN.
Fairmont
Estherville
Charles City
Mason City
Cedar
Eagle Grove
Waterloo
Spencer
Des Moines
Fort Dodge
Webster City
Cedar Falls
Canton
Le Mars
Sioux City
Yankton
Vermilion
WYOMING
ROCKY
MTS.
Chadron
Niobrara
Alliance
Scottsbluff
Gering
North Platte
Loup
NEBRASKA
3211
Broken Bow
CHEYENNE
Sidney
North Platte
R.
Norfolk
Schuyler
Columbus
Blair
Fremont
Omaha
Council Bluffs
Red Oak
Plattsmouth
Carroll
1062
Perry
Boone
Ames
IOWA
Marshalltown
Grinnell
DES MOINES
Newton
Atlantic
Oskaloosa
Albia
Creston
Chariton
Ottumwa
Centerville
Shenandoah
Grand Island
Kearney
Aurora
York
LINCOLN
Nebraska City
Platte
Hastings
South Platte R.
DENVER
5279
McCook
Holdrege
Republican
Beatrice
Auburn
Fairbury
Wymore
Falls City
Superior
Maryville
Kirksville
Trenton
Chillicothe
St. Joseph
Brookfield
Moberly
Pikes Peak
14,108 FT.
COLORADO
Colorado Springs
Solomon
Concordia
Manhattan
Junction City
Abilene
Salina
Atchison
Horton
Leavenworth
Kansas City
TOPEKA
Kansas R.
Lawrence
Richmond
Marshall
Independence
Kansas City
750
Warrensburg
Sedalia
JEFFERSON CITY
MISSOURI
Missouri
Royal Gorge
Pueblo
Arkansas
KANSAS
Smoky Hill R.
Great Bend
Larned
Garden City
Dodge City
McPherson
Newton
Hutchinson
Herington
Ottawa
Osawatomie
Emporia
Clinton
Eldorado
Iola
Nevada
Wichita
Augusta
Chanute
Fort Scott
Pratt
Wellington
Winfield
Cherryvale
Independence
Coffeyville
Pittsburg
927
Parsons
Webb City
Carthage
Joplin
Galena
Springfield
Arkansas City
Arkansas
Liberal
NEW MEXICO
TEXAS
3690
Cimarron R.
OKLAHOMA
Tulsa
Ozark Plateau
1250
ARK.
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Fig. A

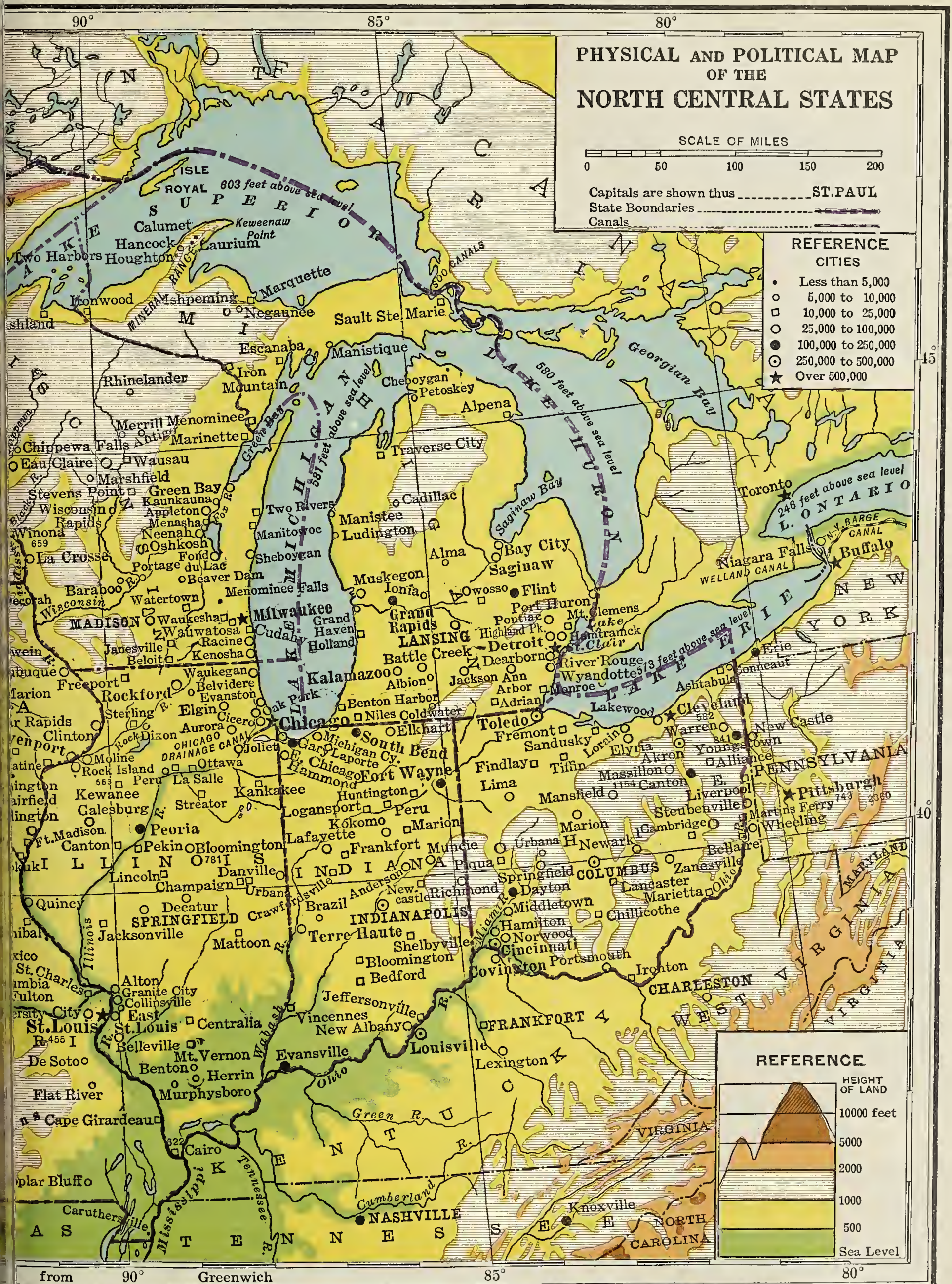

Q
R
S
1
2
3
PHYSICAL AND POLITICAL MAP OF THE
NORTH CENTRAL STATES
SCALE OF MILES
0 50 100 150 200
Capitals are shown thus ST.PAUL
State Boundaries
Canals
REFERENCE
CITIES
Less than 5,000
5,000 to 10,000
10,000 to 25,000
25,000 to 100,000
100,000 to 250,000
250,000 to 500,000
Over 500,000
REFERENCE
HEIGHT OF LAND
10000 feet
5000
2000
1000
500
Sea Level
90°
85°
80°
45°
40°
from 90° Greenwich
LAKE SUPERIOR
603 feet above sea level
ISLE ROYAL
Keweenaw Point
LAKE MICHIGAN
581 feet above sea level
LAKE HURON
580 feet above sea level
Georgian Bay
Saginaw Bay
Green Bay
L. ONTARIO
246 feet above sea level
LAKE ERIE
573 feet above sea level
Lake St. Clair
SOO CANALS
N.Y. BARGE CANAL
WELLAND CANAL
CHICAGO DRAINAGE CANAL
MINERAL RANGE
CANADA
MICHIGAN
WISCONSIN
ILLINOIS
INDIANA
OHIO
KENTUCKY
TENNESSEE
NEW YORK
PENNSYLVANIA
WEST VIRGINIA
VIRGINIA
MARYLAND
NORTH CAROLINA
Ohio R.
Wabash R.
Mississippi R.
Illinois R.
Rock R.
Wisconsin R.
Fox R.
Miami R.
Green R.
Cumberland R.
Tennessee R.
Two Harbors
Calumet
Hancock
Houghton
Laurium
Ironwood
Ishpeming
Negaunee
Marquette
Sault Ste Marie
Escanaba
Manistique
Iron Mountain
Rhinelander
Cheboygan
Petoskey
Alpena
Merrill
Menominee
Marinette
Antigo
Chippewa Falls
Eau Claire
Wausau
Marshfield
Stevens Point
Wisconsin Rapids
Green Bay
Kaukauna
Appleton
Menasha
Neenah
Oshkosh
Traverse City
Cadillac
Two Rivers
Manitowoc
Manistee
Ludington
Winona
La Crosse
Portage
Fond du Lac
Sheboygan
Beaver Dam
Alma
Bay City
Saginaw
Toronto
Niagara Falls
Buffalo
Baraboo
Watertown
Menominee Falls
Muskegon
Ionia
Owosso
Flint
MADISON
Waukesha
Milwaukee
Wauwatosa
Cudahy
Racine
Kenosha
Grand Haven
Holland
Grand Rapids
LANSING
Port Huron
Pontiac
Mt. Clemens
Highland Pk.
Hamtramck
Detroit
Janesville
Beloit
Battle Creek
Dearborn
River Rouge
Wyandotte
Erie
Conneaut
Freeport
Rockford
Belvidere
Waukegan
Evanston
Kalamazoo
Albion
Jackson
Ann Arbor
Monroe
Ashtabula
Sterling
Elgin
Oak Park
Benton Harbor
Adrian
Lakewood
Cleveland
Clinton
Dixon
Aurora
Cicero
Chicago
Niles
Coldwater
Toledo
Warren
New Castle
Moline
Rock Island
Joliet
Gary
Michigan Cy.
South Bend
Elkhart
Fremont
Sandusky
Lorain
Elyria
Akron
Youngstown
Alliance
Ottawa
La Salle
Peru
E. Chicago
Laporte
Hammond
Fort Wayne
Findlay
Tiffin
Massillon
Canton
E. Liverpool
Pittsburgh
Kewanee
Kankakee
Huntington
Lima
Mansfield
Steubenville
Martins Ferry
Wheeling
Galesburg
Streator
Logansport
Peru
Kokomo
Marion
Marion
Cambridge
Peoria
Ft. Madison
Canton
Pekin
Bloomington
Lafayette
Frankfort
Muncie
Urbana
Newark
Bellaire
Danville
Piqua
Lincoln
Champaign
Urbana
Springfield
COLUMBUS
Zanesville
Quincy
Decatur
SPRINGFIELD
Crawfordsville
Brazil
Anderson
New castle
Richmond
Dayton
Lancaster
Marietta
INDIANAPOLIS
Middletown
Chillicothe
Jacksonville
Mattoon
Terre Haute
Shelbyville
Hamilton
Norwood
Cincinnati
Bloomington
Covington
Portsmouth
Ironton
Bedford
CHARLESTON
Alton
Granite City
Collinsville
St. Charles
St. Louis
East St. Louis
Centralia
Jeffersonville
Vincennes
New Albany
FRANKFORT
Louisville
Belleville
Mt. Vernon
Evansville
Lexington
Benton
Herrin
De Soto
Murphysboro
Flat River
Cape Girardeau
Cairo
Poplar Bluff
Caruthersville
NASHVILLE
Knoxville

Fig. A

HU-1

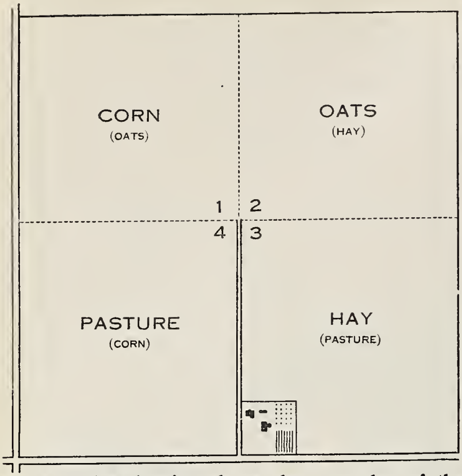


Fig. A. This drawing shows the crop plan of the Marvin farm.

most limit of the great glacier. Write in the names of the states, and four rivers.

Making the surveyor's map. Use the scale 1 inch = 1 mile, and draw a township map. Outline the township in black; a square mile in red; a quarter section in blue. Trace in green the roads that are one mile apart. Mark a good location for the schoolhouse.

Show how the ice sheet worked. Make hills and valleys in a box filled with sand or soft earth. With your hand, push the tops of the hills into the valleys. Has your hilly land become level? Tell how the glacier made parts of our country level.

The weather. "This weather is ——, and I like it because ——." Let the blank places be filled in by the corn plant; young people going to a picnic; Mr. Marvin in haying time; the cows in the pasture; the man who owned the threshing machine; the merchant who sells clothing.

New words. Use these words in sentences: prairie; glacier; township; quarter section; corn weather.

SPRING AND SUMMER ON THE MARVIN FARM

Planting oats. Figure 358-A shows the crop plan of the Marvin farm, or Marvin *quarter section,* as it is called. Early in the spring, as soon as the snow melts and the earth is dry enough to be tilled without sticking together in lumps of mud, John's father fastens his farm tractor to a disk harrow and begins to harrow the field marked *Corn*—(oats). Corn was grown in that field the year before. Thousands of farmers all through the North Central States are out in the mild spring weather doing the same thing as Mr. Marvin. In a few days Mr. Marvin with his iron horse has loosened the top soil. With his seeding machine (Fig. 354-A) he plants oats in the field. Frost may come again, but Mr. Marvin does not worry about that. Oats are a northern plant which do not mind some frost in spring. All farmers hurry to plant oats as early as possible in the spring.

Planting and cultivating corn. After the oats are planted, Mr. Marvin begins to plow the field marked *Pasture*—(corn). It was pasture last year. This year he will plant corn there. Corn is a southern plant which even a little frost will kill; so Mr. Marvin does not put the seed corn into the ground until danger of frost is past.

When he has finished planting the field with corn, Mr. Marvin has a few days in which to repair fences and do other odd jobs. When the corn is about four inches high, the little weeds that grow close to the corn plant must be killed. This requires careful work, and Mr. Marvin is proud of his skill at plowing the corn and killing all the weeds without covering the little corn plants with earth. He must cultivate the corn several times between early May and early July. This keeps him busy most of the time for several weeks.

Making hay and harvesting oats. When the corn no longer needs to be cultivated, the hay is ready to be cut. Hay grows in the field marked *Oats*—(hay). It had oats last year. When planting oats, Mr. Marvin also plants clover seed in the same field at

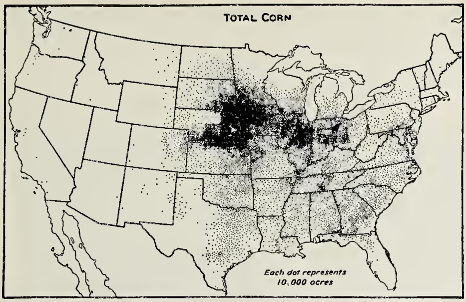


Fig. A. Corn in the United States. Each dot represents 10,000 acres planted to corn.

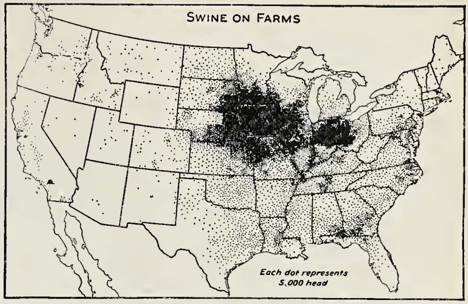


Fig. D. Swine in the United United States. Each dot represents 5000 head.

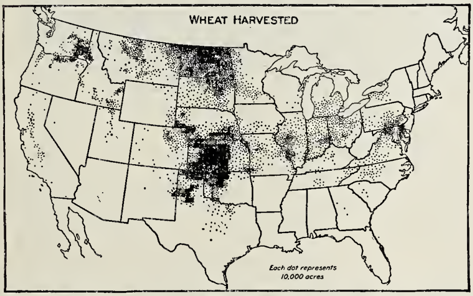


Fig. B. Each dot represents 10,000 acres planted to wheat—spring wheat to the north; winter wheat to the south.

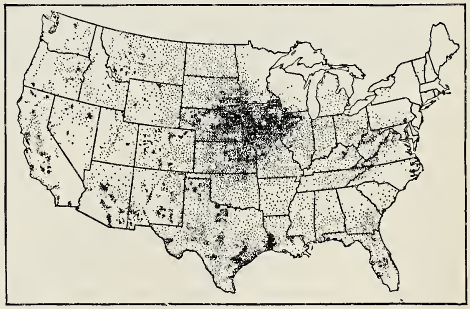


Fig. E. Cattle in the United States. Notice that the cattle are plentiful where corn and sorghums are grown.

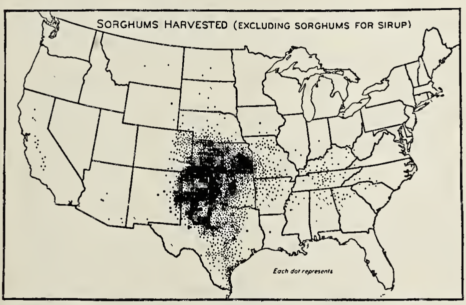


Fig. C. Sorghums in the United States. Each dot represents 2000 acres planted to sorghums.

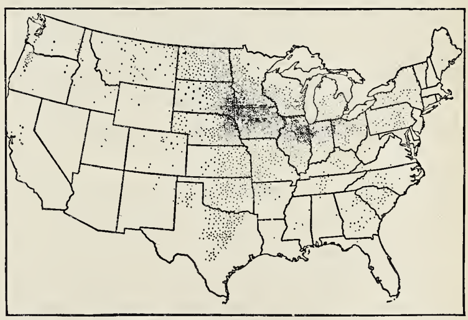


Fig. F. Oats in the United States. Each dot represents 10,000 acres planted to oats.

the same time. The oats grow quickly and are harvested in about a hundred days after planting. The clover, which lives two years, grows more slowly at first, so the clover plants are still young when the oats are cut. The clover makes a fine big crop in the spring of the following year.

John is only thirteen years old, but he can drive the two horses that pull the mowing machine which clips off the clover close to the ground. When John has cut a few acres of the clover, he hitches the

horses to a farm machine called a *side-delivery rake*. It rakes the hay into long, low rows, called *windrows*, and another machine, called a *hay loader*, puts the hay on the wagon. Mr. Marvin and another man he has hired are on the wagon, working very fast with pitchforks to spread the hay on the wagon as the hay loader carries it up. They take the hay to the barn until the barn is full; the rest they make into a big stack in the hayfield.

Mr. Marvin, John, and the extra man start early and work late at haymaking. They want to finish harvesting hay before rain wets it. Hay is not so good if it gets wet. Also, the oats will soon be ripe and should be cut before the wind and rain beat them down.

Another farm machine, called a *grain binder*, cuts the oats, ties them in bundles, and drops the bundles off in piles. The field is so level and smooth that John can drive the three horses that pull the binder. Meanwhile his father makes the bundles of oats into piles called *shocks*. In four days of hard work the horses, the boy, and the men with the help of this wonderful machine have cut the forty-acre field of oats, tied the crop into bundles, and left the field dotted with shocks of grain.

Neighbors exchange help. As the oats stand drying in the sun for a few days, a tractor comes along the road pulling a large threshing machine, called a *separator*, behind it. This outfit pulls into the barnyard. The men turn the engine around and put a belt from its flywheel to the separator. Thus they make the tractor run the separator. Some of the neighbors come with their wagons and teams to help the Marvins. The men haul the oats from the shocks in the field to the threshing machine and throw the bundles into its roaring throat. The teeth inside the thresher tear bundles of oats to pieces and knock out the grain. A stream of oats runs out of a spout into wagons. The straw is carried by a strong current of air through a pipe and blown out into a big pile. If you have traveled across Ohio, Indiana, Illinois, Iowa, and Nebraska in late July and early August, you have seen dozens of separators from the car window every hour.

The day they thresh oats at the Marvin farm, Mrs. Marvin and her daughter cook a very good dinner for the family and the neighbors who come to help. For the rest of the week Mr. Marvin and John go to the neighboring farms with their team and wagon, where they haul oats to pay for the help the neighbors gave them with their threshing.

The month of August on the Corn Belt farm. It is now August. The hay is cut and safely stored in barn and stack. The oats are harvested and threshed, and the grain is stored in the barn. The corn does not need to be cultivated again. The stalks are taller now than Mr. Marvin. At their tops the creamy white tassels are in bloom, and you can smell at a distance the pleasant odor of these blossoms. As the wind blows, it rubs the long, dark green blades (leaves) of corn against one another with a rustling sound that is like music to Mr. Marvin. He sees the young ears growing rapidly on the tall, strong stalks, and knows that he will have a good crop.

Mr. Marvin now cleans up the farm a bit. He cuts the weeds along the road with a mowing machine. With a scythe he cuts the briers and bushes that are growing along the fences. Then he and Mrs. Marvin and the children go in their automobile to visit relatives in Wisconsin. During the five days they are away from home the horses stay in the pasture and eat grass. A neighbor comes over each day to look about the place to see if every-

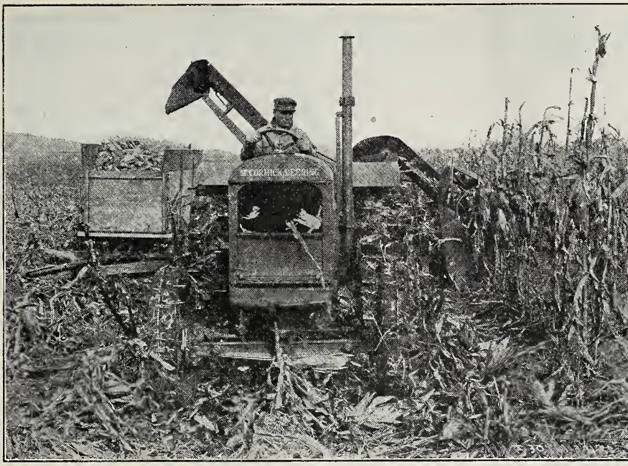


Fig. A. The machine in the picture husks corn and drops the ears in the wagon alongside much faster than Mr. Marvin husked his corn.

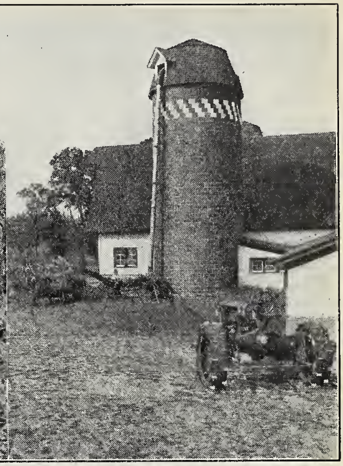


Fig. B. Filling the silo. See the belt which drives the machine; the pipe up which a current of air carries the chopped corn plant.

thing is safe. He feeds the chickens and pigs and milks the Marvin cows, and sees to it that the windmill is working to pump water for the animals.

A work calendar for Mr. Marvin. 1. Copy the left-hand column, and fill in the right-hand column with work Mr. Marvin does:

Early spring	
Later spring	
Early summer	
Late summer	

2. Tell why Mr. Marvin's neighbors are so helpful.

3. Tell how Mr. Marvin might use the "rag doll" shown in Figure 362-B.

A city boy visits the country. Let a pupil be a city boy who visits John Marvin. Let another pupil be John Marvin. What would the two talk about? Make a pretend visit.

The iron men on the Marvin farm. Find in the book or in magazines pictures of each machine, and tell the work that it does.

disk harrow	binder
seeding machine	traction engine
mowing machine	threshing machine
horse rake	windmill
hay loader	

Tell how these things on Mr. Marvin's farm help people in New York City.

Farm plan. Copy the plan of the Marvin farm, and write on the plan the crops that will be in each field next year; year after next.

WHAT BECOMES OF THE GRAIN

Filling the silo. About the first of September the corn crop is ready to be harvested. Beside the barn stands the silo, a round building forty feet high. It may be built of concrete and should last a long time. The barn may tumble down of old age, or it may burn, but the silo will be there just the same. Mr. Marvin will fill the silo with chopped corn (ensilage). Again the neighbors come to help. The stalks of corn are still green and the ears are unripe, but the corn is ready to go into the silo. The neighbors go to the field, cut the corn, and haul it in wagons to the silo. The stalks are pushed into a cutting machine which chops them into half-inch bits and blows the bits up a long pipe to the top of the silo. The chopped corn keeps dropping in until the silo is full. Ensilage keeps moist and warm through the winter. How the cattle love to eat this steaming, warm food on cold winter mornings!

The corn that is husked. Only a part of the corn crop is needed to fill the silo.

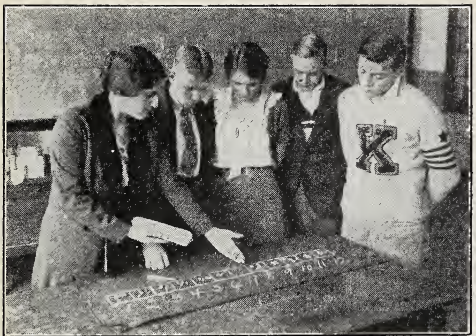


Fig. A. The teacher is showing the pupils how to make a "rag-doll" seed-corn tester.

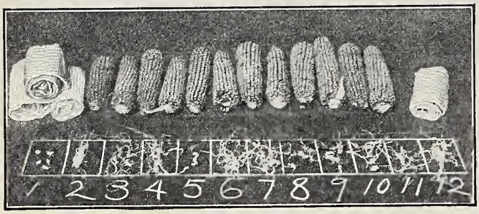


Fig. B. Sample grains have been taken from each ear and rolled in a moist cloth (*rag-doll tester*) to sprout. Notice the sprouted seeds and the twelve ears of corn from which they were taken. Which ear would you use for seed?

Most of it is left standing in the field until frost comes in October and the grains have become ripe and dry. In the frosty October days John and his sister are again in school, and their father harvests the corn. With two horses and an open wagon he goes to the cornfield. There he walks beside the wagon, and, as he walks, he twists the ears of corn from their stalks, pulls the husks from the ears, and throws the dry ears of corn into the wagon. The ears strike the wooden wagon bed with a bumping sound. On still mornings he can hear ears of corn bumping into wagons on the neighbors' farms. Thousands of other men in half a dozen states are out in the crisp October air husking corn.

As I cross the Corn Belt from time to time and see the fields of corn and oats, corn and oats, corn and oats all day and all the next day as the train speeds on, I wonder what in the world can become of so much grain. Mr. Marvin and his neighbors have an answer to my question.

Corn becomes pork. Mr. Marvin feeds his grain to hogs and cattle, and that is what most of the other farmers do with their grain. Mr. Marvin raises ten families of pigs, seventy pigs in all. The pigs spend the summer eating grass in a pasture field. Mr. Marvin also gives them a feed of corn every evening. In the fall they eat most of his corn crop. Instead of selling corn, he sends a carload of fat pigs to Chicago in December, and more in February.

John is a member of the pig club at his school and he owns a fine black-and-white pig. He is very proud of his pig, and he tries to feed him so that he may grow and weigh more than one pound for every day of his life. The pig was born in March, and weighs 250 pounds when he goes to market in November.

Corn becomes beef. Fifteen cattle also spend the summer eating grass in the pasture field. In the winter they eat the hay, some of the oat straw, most of the oats, the ensilage, and some of the corn. When the cattle are fat, they, too, go to Chicago, where we shall see them when we read about Chicago (page 374). These cattle spent the first year or two of their lives on a ranch in New Mexico.

Although Mr. Marvin grows corn, oats, and hay, he does not sell corn, oats, or hay. Instead, he sells fat hogs, fat cattle, milk, and cream to help feed the people in our cities and in other countries.

Corn becomes mutton chops. Mr. Wood, the nearest neighbor to the eastward, does not like raising hogs and cattle. He thinks he can make more money raising sheep, and so, every autumn, he buys several hundred lambs that come by freight train from ranches in the Western

Fig. A. These boys are members of a pig club in Kansas. They are judging which pig will receive first prize.

Fig. B. This boy is a member of a corn club. He exhibited ten ears of his corn at his county fair and won first prize. How is he helping the boys in Figure 363-A?

States (page 305). Like Mr. Marvin, Mr. Wood raises corn, hay, and oats. He has a busy time through most of the winter months carrying corn, oats, and hay to the racks and troughs where the lambs feed. He sees that his lambs have plenty of water to drink and are comfortable and contented. He watches the lambs getting fatter every day until they, too, go down to the stockyards at the near-by railroad station and are put into cars for Chicago.

The man who sells grain. Mr. Andrews, Mr. Marvin's neighbor on the farm to the south, does not like animals at all. He prefers to sell corn and oats. So he has most of his farm in these crops. Mr. Andrews takes many wagonloads of corn and oats to the grain elevator at the railroad station, to be sent with the grain of other farmers to Chicago. Mr. Andrews, like Mr. Marvin, sows sweet-clover seed with his oats. Sweet clover is a legume (page 261) with nodules on its roots (Fig. 262-B). The oats are cut in July. The clover grows through the summer and autumn. Sometimes Mr. Andrews pastures some animals for another farmer or a live-stock dealer. In spring he plows his sweet clover under to fertilize his corn crop. After the corn comes another crop of oats and clover.

Up and down the Corn Belt you may go — north, south, east, and west — and you will find tens of thousands of farms like these farms, all of which produce corn, oats, grass, and hay. The farmers fatten pigs, cattle, or lambs, or they sell corn or oats. Sometimes they sell the hay after it is pressed into bales and bound with wire.

The dairy farmer. Sometimes the Corn Belt farmer manages his farm in yet another way. He feeds his crops to a herd of cows and sells milk and butter. He is more likely to do this if he lives near a city where thousands of bottles of fresh milk are needed each day, but there are also many farmers who keep a few cows and sell cream to the butter factory at the railroad station. Does the map of dairy products (Fig. 367-A) show you where the larger cities are and where dairy farms are to be found? Cheese and condensed milk are also made in places far from city markets. Why is this?

Fig. A. The tractor in the picture is pulling a harvesting machine which cuts the wheat, threshes it, and pours the grain into an automobile tank wagon which is driven alongside.

Add to your calendar. Show the work of the Marvin family during the autumn and winter on your *Work Calendar.*

New words to use in talking about the Corn Belt. Use each of the following new words in sentences: ensilage; concrete silo; legume; fertilizer; racks; troughs; stock-yards; grain elevators; nodules.

The story of three farmers. Tell the story by copying and filling in the columns with these expressions: raises; raises and sells; buys; fattens and sells; buys or raises.

	Farmer Marvin	Farmer Wood	Farmer Andrews
Corn			
Oats			
Hay			
Cows			
Pigs			
Sheep			
Cattle			

Make the whole Marvin farm on the sand table. You may plant grass or grass seed for hay, and real corn and oats. You may make a cardboard road and automobiles, and you may put animals of wood or cardboard in the pastures. If you are clever at drawing, you may even draw the farm machinery. You will need a windmill, a silo, and barns.

WHEAT, OUR FAVORITE BREAD-STUFF

Wheat instead of oats. Some Corn Belt farmers choose to grow wheat instead of oats. Wheat and oats are sown, harvested, and threshed in the same way. Look at Figure 359-B and tell what states grow wheat in large quantities.

The wheat-growing area centering in the Dakotas is called the *spring wheat belt;* the area centering in Kansas (Fig. 359-B) is called the *winter wheat belt.* Wheat is so hardy that it may be planted in the autumn in the southern part of the North Central States; and if the plants get well started before the ground freezes, they usually live through the Corn Belt winter, grow like thick grass in early spring, and send up tall shoots and make heads of grain in the early summer. Winter wheat is harvested in June in the Corn Belt.

The wheat farms of Kansas. What is the rainfall of the eastern part of Kansas? of western Kansas? Corn does well in eastern Kansas, but it needs more rain than some parts of western Kansas have.

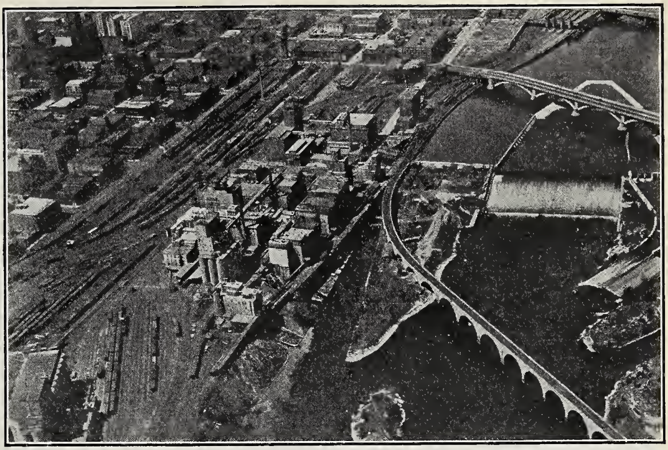


Fig. C. In the picture above you are looking down on the falls of the Mississippi River at Minneapolis. The buildings beside the falls are flour mills. How may the falls have helped to start flour milling in this great city?

Figs. A, B. Find in the pictures at the left a head of smooth wheat; a head of bearded wheat; grains of wheat actual size.

Wheat can get along with less rain than corn must have to do well; therefore in central Kansas we find a large area where the farmers grow much wheat and but little corn. Many grow nothing but wheat. Their farms are large and the farmer often lives in town, several miles from his land. Some people say that his town should have a factory to give him a job when his wheat does not need him.

In winter this wheat grower's farmyard may be full of wheat-growing machinery. He begins his wheat year in summer by plowing the ground for the fall planting. For a month or six weeks he is very busy with tractors or horses from early morning until night during good weather, but when the wheat is sown in September or October, he has nothing to do until the next June except to repair his machines and see that they are in order. When harvest comes, he again works early and late for a few weeks. Men sometimes come out from the cities to help harvest wheat. The wheat grower on the big farm does not use a binder such as we saw on the Marvin farm. Instead, he uses a big machine called a *combine*, which cuts off the heads of the wheat plants, threshes them, drops the straw on the ground and either puts the wheat into sacks or pours it into a wagon or truck (Fig. 364-A) which goes beside the combine. The grain then is taken to the elevator at the railroad station.

In a few days long trains, with many cars full of wheat, rumble away to Kansas City, Chicago, Galveston, or New Orleans.

Spring wheat. Do spring wheat and winter wheat grow in the same place? Do the areas of these two crops touch? Figure 359-B will help you to answer these two questions. Spring wheat is much like winter wheat, but it is planted at a different time. Spring wheat is grown in the north, where the winter is so very cold that wheat plants are often frozen to death if planted in the fall. Therefore the farmer plows the ground in the autumn or early in the spring, plants the wheat in the springtime as they do with oats, lets it grow through the summer, and harvests it at the end of summer.

Fig. A. The good wheat lands in the valley of the Red River of the North. Tell why this land is so flat.

Flour and trade. Find Minneapolis and Duluth (Fig. 356-A). Which wheat region are they near? The market for most of the spring wheat is east of the place where spring wheat is grown. Much wheat is eaten in the Eastern States and in Europe. Minneapolis, St. Paul, and Duluth are places on the road between the spring-wheat fields and the eastern markets, and thousands of carloads of wheat go through these cities. Minneapolis grew beside the falls of St. Anthony in the Mississippi River. The water of these falls turns the wheels that drive the machinery of many flour mills. The largest mills grind as much as 20,000 barrels of flour in a day, and Minneapolis is one of the greatest flour cities of the world. Its product goes to hundreds of eastern cities and even to foreign countries.

Other small grains. The spring-wheat region is too cool in summer, and often too dry, also, for corn to do so well as it does in Iowa. Instead of corn, the spring-wheat farmer often grows a field of rye, oats, or flax. These small grains are grown and handled as oats and wheat are handled. Flax is an important crop in North Dakota. The flaxseed is ground and pressed. This gives linseed oil for paints and linseed cake for cow feed.

Red River Valley. The spring-wheat region in the valley of the Red River of the North (Fig. 366-A) is one of the most level pieces of land in the world. In the time of the glaciers it was the bottom of a large lake, and the soil is soft and splendid for the easy use of machinery.

This table makes study easy. Study these three maps: corn map (page 359), wheat map (page 359), and dairy-cows map (page 367). From what you learn you may copy and fill in this outline, using blanks, or a check for "a little"; a cross for "more"; and two crosses if "very important."

States	Winter Wheat	Spring Wheat	Corn	Dairy Cows
No. Dakota				
So. Dakota				
Nebraska				

If bread could speak. If a loaf of bread could speak, it would tell an interesting story. Write or tell the story of bread. See how many of the pictures in this book will help to illustrate the story.

RANCHES AND DRY FARMING NEAR THE WESTERN BORDER

The western part is different. One night in July I went to bed in a sleeping car in west central Iowa. The last things I had seen as daylight faded were corn and oats, corn and oats, corn and oats. Early the next morning I looked out the window and saw hay, hay, hay — a wide valley with dozens and dozens of haystacks. I was in the valley of the Platte River west of North Platte, Nebraska. I looked again and saw a stream of water five or six feet wide. The stream was so straight and its edges were so smooth that I could tell at a glance that man, not Nature, had made it. The straight stream was an irrigation canal. The haystacks were alfalfa. The irrigation canal had carried water to the alfalfa. This is a part of the Great Plains region, which lies east of the Rocky Mountains. The Platte River is one of the Rocky Mountain streams that brings snow water from the high peaks and thus helps men to irrigate the valleys in ranch land.

The land of ranches. As I looked at the irrigation canal and the haystacks, I saw some hills a few miles away on either side of the river, but on the hills there were no trees and few farms. I was near the land of ranches, which occupy the uplands above the valley of the Platte. What is the rainfall of that place? The western part of four North Central States is in the Great Plains (Fig. 356-A). Instead of having 160 acres of land for a farm, as at Marvin's, a family may have two or three or even four square miles for a ranch. Much of the land is left to grow such grass as the chance rains of nature will bring. Here and there it has been plowed and planted to crops. Some of the land should *never have been plowed*. Without grass to hold it, the good surface soil blows away in dry times. Dust from these fields has clouded the sky in places as far east as New York City.

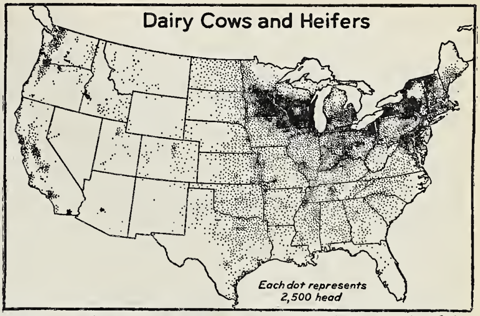


Fig. A. What three states, in your judgment, lead in the number of dairy cows and heifers?

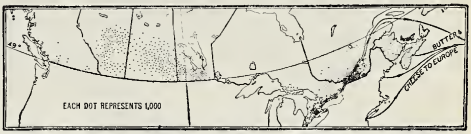
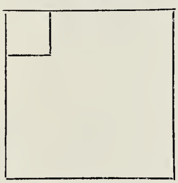


Fig. B. Dairy cows in Canada. The dairying districts of the United States continue on into Canada.

Dry farming. Most of this dry region at the western border of the North Central States is in ranches, but some of this land is cultivated by dry-farming (page 338).

Compare a ranch with Marvin's farm.

1. The larger square is a ranch; the smaller one is Marvin's farm. The scale is 1 inch = 2 miles. Find the area of the ranch in square miles; in acres; the length of the fence around the ranch.



2. Find the area of Marvin's farm in square miles; in acres.
3. How many times larger is the ranch than the farm?
4. Why is it so large? Figures 319-A and 368-A will help you to answer this question.

What I saw from the train window.

1. Tell what you saw from the train window, using these words: irrigation canal, alfalfa, Great Plains, ranch lands, haystacks, dry farming, Corn Belt, oats, quarter sections.
2. Write for a bulletin from the Soil Erosion Service, U. S. Department of Agriculture, Washington, D. C., telling about wind erosion, its cause, its damage, and its cure.

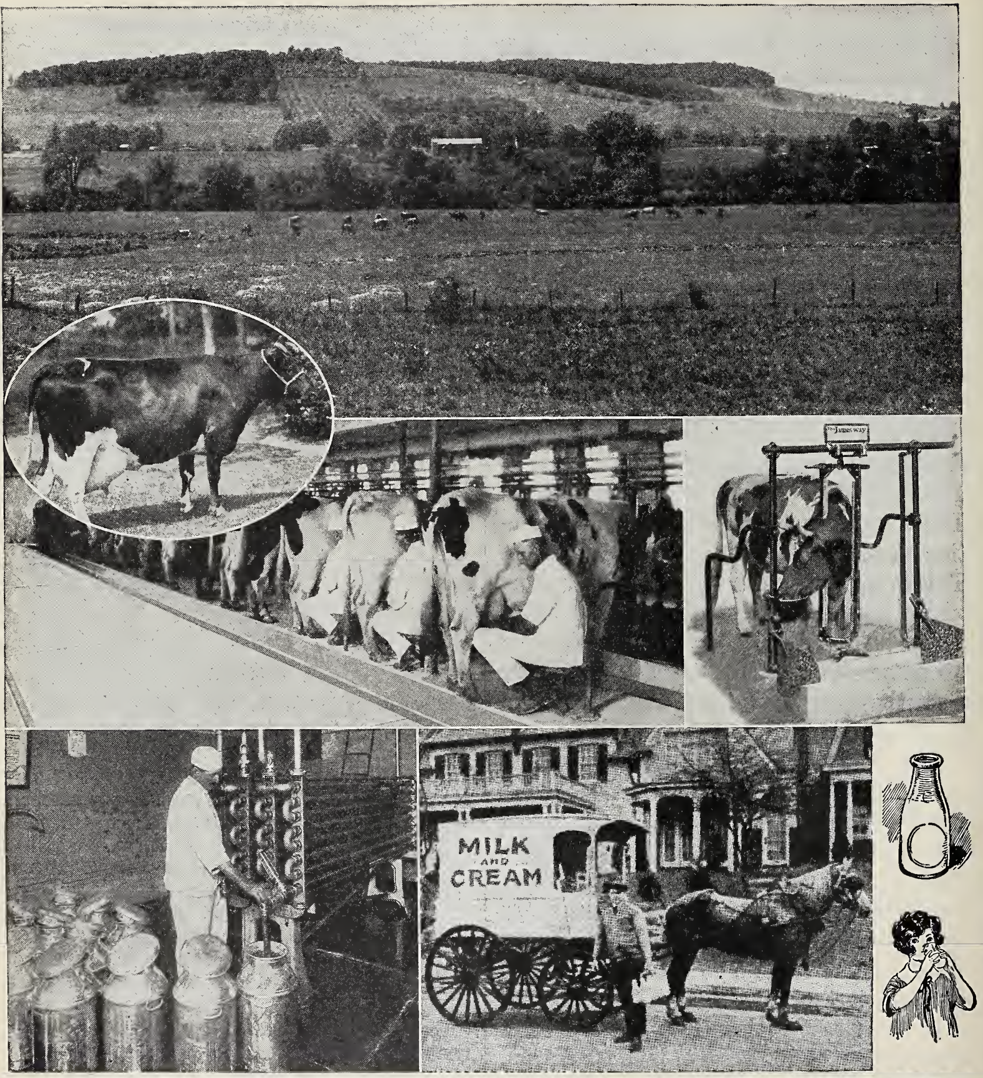


Fig. A. After you have studied these pictures, you may write a story. Call it "The Story of a Glass of Milk." De Kol Plus Segis Dixie, whose picture you see in the oval, is one of the champion dairy cows in the United States. In one year 1686 pounds of butter were made from her milk. The cow in the square has a cement trough for her food and a drinking cup where water flows whenever she drinks it.

CAN WE CALL A FARM A FACTORY?

The land of butter and cheese. Trace an outline map of the North Central States and mark on it the leading dairy region. Figure 367-A will show you where it is. Minnesota produces about a sixth of the creamery butter of the United States, and Wisconsin makes much butter and more than nine times as much cheese as any other state. Every day of the year, locomotives pull carloads of butter and thousands of pounds of cheese from this region

to Chicago, Pittsburgh, New York, Boston, and a thousand smaller towns. Wisconsin also has factories that send out thousands of cans of condensed milk. In fact Wisconsin and New York lead all the other states in the production of dairy products.

Why are there so many dairy farms here? There are several reasons. One reason is the ancient glacier (page 354). You found that the glacier had made the central part of the Corn Belt level, smooth, and easy to cultivate. The glacier was not so kind everywhere. As it crossed the Great Lakes, it scooped out millions of carloads of sand and clay and stones. In many parts of Wisconsin it dropped some of this load, making many little hills. Therefore much of the land near the northern edge of the Corn Belt in Wisconsin, Michigan, and Minnesota (Fig. 359-A) is not so good for plowing as are the smooth, level, rich corn plains farther south. The farmer cannot grow so much corn and other grain as he can on the Marvin farm; so he uses his crops by making his farm into a milk factory. Instead of selling a hundred dollars' worth of grain, he feeds silage, grain, and hay to cows. All winter he milks the cows, and, instead of having a hundred dollars' worth of grain, he sells two hundred dollars' worth of milk or cream.

The milk is put through a whirling machine, called a *separator*, which separates the cream from the milk. The farmer takes or ships the cream to the butter factory, and feeds the skimmed milk to pigs. One man at the creamery, with the aid of machines, makes the butter for dozens of farmers, or he may make cheese from the milk.

The lower peninsula of Michigan is much like Wisconsin in surface, soil, and climate, and in dairying. Between Chicago and Detroit is a string of cities. Most of the milk goes to the people in these cities.

The short summer affects dairying. The short summer in the northern part of the North Central States also helps to make farmers keep cows. There is frost until May, and it comes again in September, so that for more than half of the twelve months nothing grows. In April and May, and again in August and September, the farmers are busy with their wheat, oats, rye, or flax. But what then? What will they do all winter? If they have a barn full of cows, they have a job; otherwise they would have little to do during most of the winter. So they, too, use their crops as raw materials for milk. There is another thing that helps. Corn can be put into the silo before it is ripe and dry. Because of this, the farmers can grow corn for silage where the summer is too short and cool to allow the grain to ripen as it ripens on the Marvin farm.

Cities map. 1. On your outline map of the North Central States make a mark for the location of every city with more than 50,000 people (Appendix, page 11).

2. Map some main-line railroads that come into Chicago from cities to the west; from Chicago to Detroit; from Chicago to Cleveland and Buffalo, to Columbus and Pittsburgh.

Giving more reasons. 1. Give a climate reason and a population reason for the many cows that are kept in the North Central States.

2. Why may we call the farmer's barn a milk factory? What is the raw material in this factory?

Cows keep good company. Prove this by copying and completing the following sentences:

Cows go well with corn because ——; with pigs because ——; with wheat because ——.

Making butter. Collect a penny or two from each child in the class. Buy some cream. Let it sour. Churn the cream at the temperature of 57° F. Use an egg beater or spoon and make sweet butter. When the butter forms, there will be some buttermilk.

Fig. A. This land was cleared of trees and plowed. Then the rains came and washed all the good soil away.

Fig. B. One row of these apple trees on a grassy Ohio hill had nitrate of soda. The other row had none.

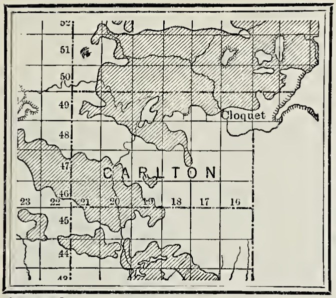
THE FARMERS OF THE SOUTHERN HILLS AND THE LAKE SHORES

The hill lands of the southern border. As you go from Chicago toward the Ohio River, your train runs for miles and miles over flat, smooth land that was leveled by the glacier. Suddenly you find yourself among hills — steep hills; hills in all directions. Here the roads do not run one mile apart. They wind in and out around the hills, up the streams, or along the hilltops, wherever they can find a place to go. This hilly land is found all the way across southern Ohio, southern Indiana, southern Illinois.

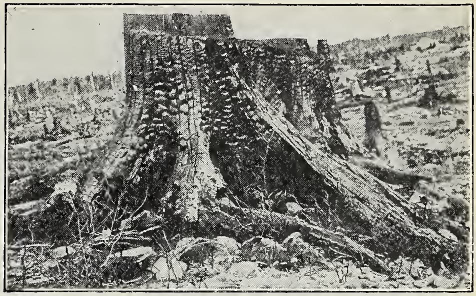
In southern and southwestern Missouri we have the hilly land that makes up the northern part of the Ozark Mountains.

Gullies, grass, and trees. What can the farmer do with the hills? If he plowed them every year or two, as is done on the Marvin farm, the swift-running water after the heavy rains of summer would wash the soil away until there was not enough left for a crop. Indeed, that has been done on many, many of the hills in all of these states. Thousands of acres of land have already been ruined by gullies (Fig. 370-A). In this land of hills, the farmer who takes good care of his land has found that he can plow only the more level parts of it. The rest he must leave in grass or trees. In some sections the farmers keep sheep, which eat the grass of the hills. Sheep will even dig down through a little snow in winter to get the dry grass that has been left from summer. These farmers sell wool and lambs. In the Ozark country much of the land is still in forest, and only the better parts have been turned into farms. On some of these Ozark hills the farmers keep cows and sell cream, and others grow apples and peaches. Many of the people in the Ozarks live as do the people we read about on page 281.

The lakes aid fruit growing. The waters of the Great Lakes have made fruit farming very important in a few small areas in the North Central States. Look closely at Figure 357-A and you will see a peninsula in eastern Wisconsin. Between what two bodies of water is it? It is called the Door Peninsula. In the spring of the year, when every fruit farmer fears the damage that frost may bring, the fruit orchards on the Door Peninsula are much safer than they would be a hundred miles west, because the cold water on both sides of the peninsula keeps the air cool and keeps the trees from coming into



Land burned over by forest fires.



Figs. A and B. The map at the left shows the west end of Lake Superior and the land burned over by forest fires in one year. After many such fires, comes the desert at the right. Dark, spongy earth once carpeted the stones.

bloom until after the danger of frost is almost surely past. In the autumn the water that surrounds the peninsula, warmed by the long summer days, is so warm that it keeps the autumn frosts away from the peninsula. The farmers here have thousands and thousands of cherry trees.

Other fruit districts. There are several smaller peninsulas along the lakes that have fruit industries, but the most important fruit belt is a district about twenty miles wide along the Lake Michigan shore in western Michigan. Boats carry the fruit to Chicago in a night, and trucks deliver it in three states.

Add to your glacier map. Shade the hilly lands between the southern limit of the glacier and the Ohio River. Put *x*'s on the Ozark Plateau. Darken the Ohio River. Look at Figure 370-A and at Figure 279-A and then tell something important about each.

Ask me another. Here are some questions for you to answer about the trees, sheep, and fruits of the North Central States. Ask another question about each of these things for your classmates to answer.

1. Why should the hilly-land farmer let trees and grass grow?
2. Why are sheep raised on hilly lands?
3. Why are fruit trees grown on the hills?
4. Why are fruit trees grown on lake peninsulas?

A muddy experiment. In a corner of the playground, level a space about two feet square. Make mud hills on another space beside it. Now, turn the hose or a watering pot on both of these places; let the water play lightly. Where are gullies formed?

FORESTS, VACATIONS, AND MINES NEAR THE UPPER LAKES

White pine. When the white settlers came to the North Central States, the region near the lakes was a grand forest. It covered most of Michigan, Wisconsin, and northeastern Minnesota. White pine was the most important tree in the forest. White pine makes the best timber man has ever found. It is soft and easy to work, yet it is strong. It does not split easily. It does not warp much if it lies in the sun, as do oak and many other woods. It does not shrink much when it dries out, as do many woods. It does not have sharp splinters to hurt your hands. If you build your house of white pine, it will last a very long time.

We slaughtered the forest. The great forests of pine, which had taken two or three hundred years to grow, were a kind of lumberman's heaven. It was easy to build short railroads into the forest from ports on the lakes. The ground might be rough, but the heavy snow of winter leveled it off, and the horses walking on the snow could drag sleds loaded with heavy logs over ground where they could not walk in summer because of stones or swamps or fallen logs. Winter after winter the lumberman camped in the forest, felled trees, and sent the lumber into the treeless Corn Belt and Wheat Belt, where it was used to build farmhouses, barns, and fences. The lake boats

Fig. A. The largest open-pit iron mine in the world. It is near Hibbing, Minn., and is one of the largest holes that man ever dug. How many steam shovels can you find? How many different levels for working?

carried lumber to Chicago and Cleveland and Buffalo. The canal boats on the Erie Canal carried it on to the eastward.

The states take turns. At one time Michigan led all the states as a lumber producer. Then, as these forests were exhausted, Wisconsin became the first lumber state in the Union. Then, when Wisconsin forests had been heavily cut, Minnesota became the first lumber state in the Union.

The lumberman had no thought of the future. He bought a tract of land, cut off the lumber, and moved on. The bushy tops of the trees that he had cut often caught fire and all the smaller trees that were left in the forest were burned. These fires burned even the top soil. Some places are now bare sand and others are bare rock where splendid pine trees stood in 1870 or 1880. Find from the Appendix how much lumber the three upper lake states now produce. Many European countries take care of their forests so that they keep on yielding year after year.

The forest sections of the lake states now have many mills run by the power of forest streams, grinding small logs into pulp for making paper.

When Michigan was a leading lumber state, a great furniture industry arose at Grand Rapids and other towns. Grand Rapids is known as the home of the leading designers of furniture in this country.

The land for perpetual forest. Much of this land in the northern part of the lower peninsula of Michigan, the upper peninsula of Michigan, northern Wisconsin, and northeastern Minnesota did not become farms after the forest was cleared because it had received the worst touch of the glacier. In some places so much of the earth was scraped off that little but bare rock remained, with trees clinging here and there in the cracks. In other places the rivers running out of the glaciers had carried away all the light particles and left only coarse sand. In still other places the glacier had dumped stones and made the ground so rough that it could not possibly be made into fields. In yet other places the glaciers, by pushing about the rocks and earth, had made many little basins that became lakes and swamps. There are thousands of lakes in this part of the lake region. The state of Minnesota alone has about ten thousand. Some of them are not much bigger than a

baseball diamond. Others are several miles across.

This region of lakes, swamps, rocky land, and little glacial hills should stay in forest.

Vacations. This northland of lakes, streams, and woods is a delightful place in summer, and every year thousands of people come here for a summer vacation in camp, cottage, or hotel.

Copper. The rocks that lie under the earth near the western part of Lake Superior are very old. They are some of the oldest rocks in the world. Long ago, very long ago, they were deep down under high mountains. They were bent and twisted and cracked and heated, and down deep under the earth something happened to gather useful minerals into masses which we call *ore*. Then, through ages and ages of time, the streams wore the mountains away, and now we can look at the roots of these old mountains of the very long ago and find the ore. Even before white men came, some peoples had found copper in northern Michigan and dug some of it out of the ground. The Keweenaw Peninsula has such rich copper mines that the state of Michigan has a school of mines at the near-by village of Houghton. There young men study to be mining engineers. Near by is Calumet, the name which a great copper company has taken.

Iron ore near Lake Superior. On both sides of Lake Superior, in Wisconsin and in Minnesota, men have found very large bodies of iron ore — the richest iron mines in the world. Some of the ore is very near the top of the ground, and men can scoop it out with steam shovels and dump it into trains alongside. The locomotive pulls the cars out of these open-pit mines (Fig. 372-A) and takes them to great piers at Duluth or one of several other harbors along the lake. At the pier a man on the train pulls a lever. This opens a door in the bottom of the ore car, and fifty tons of iron ore fall out of the car and drop into the big ore bins beneath the tracks, with a noise like an earthquake. Presently a lake steamer, which is really a great, long, floating box with an engine in one end of it, draws up alongside the pier. A row of spouts is let down into the steamer's hold; a man pulls a lever again. This time it opens doors in the ore bins and the ore rumbles and roars down the spouts and chutes into the lake steamer. Sometimes as much as 10,000 tons of ore are loaded in an hour. The ore-loading record is held by the steamer *G. D. Kerr*, which loaded 12,508 tons of iron ore in 16½ minutes. Down the lake go the big floating ore boxes, carrying iron ore for the furnaces of Detroit, Buffalo, Cleveland, Pittsburgh, and Chicago. Tell why we might call Duluth and the other towns at the west end of Lake Superior "funnel cities."

Praise for the pine tree. List seven reasons why white pine is a good wood.

The story of lumber. Tell the story of lumber in the Upper Lake Region, and use the words: big, vast, rough, barn, train, snow, sled, boat, treeless, city, railroad, farm, fire. How many of the pictures in the book help you with your story? The one who finds the most pictures scores 10.

A good citizen leaves the world better than he found it. 1. Was the lumberman of 1880 a good citizen? Explain.

2. How did the lumberman find the forests around the lakes?

3. How did he leave them?

4. What do you think of this?

Damage done by the glacier. Make a list of all the things done by the glacier that do not help man today.

A free-hand map. Draw a free-hand map of the Great Lakes. Show the copper mines of Michigan by writing *C*; show the iron mines near Ashland, Duluth, and Hibbing by writing *I*. Draw lines through the lakes to show how copper and iron ore are shipped from the *funnel cities* to the *furnace cities*. Write the initials of these cities on your map.

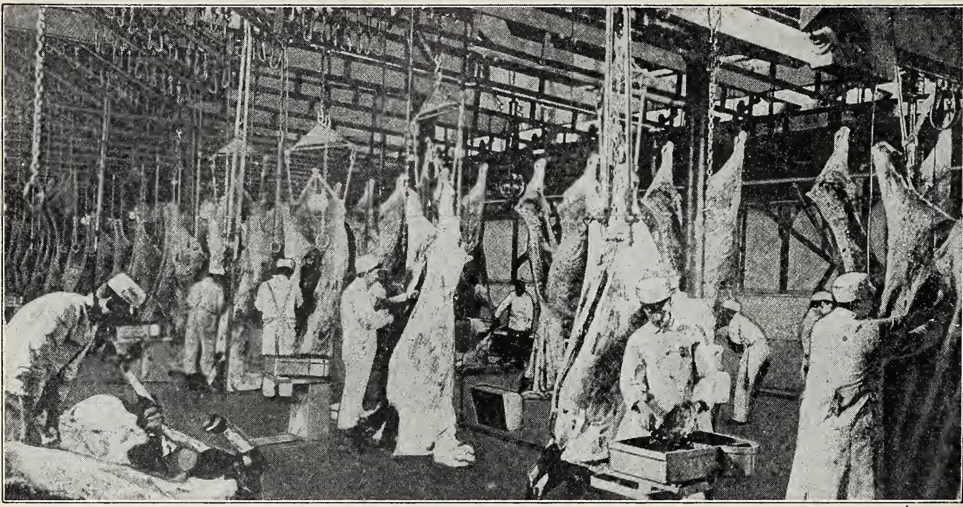


Fig. A. Dressing beef in a Chicago meat-packing plant. In these large plants cattle are slaughtered, skinned, cleaned, and cut into large pieces, even more carefully than your mother prepares a chicken for cooking.

CITIES

How the lakes make cities. Lake Michigan reaches far inland toward the center of the rich farm lands and gives cheap freights with its lake steamers. Lake Superior reaches far westward toward the lands where spring wheat is the chief crop (Fig. 359-B).

Suppose the oats which Mr. Marvin's neighbor in Iowa sells are going to England. They could go by railroad to New York, but the lake boats carry freight much more cheaply. Therefore grain is sent by rail to Chicago, and there is put into a lake steamer. This cheap boat freight makes Chicago a place where much freight is unloaded from trains and put into boats. That is one reason why the city has grown so big that it stretches for miles and miles around the end of the lake. It takes you hours to drive through Chicago in an automobile.

Find Duluth on the map (Fig. 356-A). Now find the spring-wheat region (Fig. 359-B), and the ship canal that lets steamers pass around the rapids between Lakes Superior and Huron. Point out the cheapest route for the wheat to reach New York or Montreal. If the wheat is from Canada, it may go to Fort William instead of Duluth. Can you now imagine great streams of wheat and oats and corn moving, first by rail and then by boat, out of the Central States?

Chicago, the great metropolis. For a long time Chicago has been the greatest grain market in the world. See if you can find the reason by examining the agricultural production maps (*dot maps*) on page 359. Now write a statement about Chicago.

Beside the harbor in Chicago are tall grain elevators which take the grain as it is unloaded from the cars. Inside the elevators are belt conveyors which lift the grain and let it run down to the lake steamers that lie on the other side of the elevators. The lake boats have a busy summer and a quiet winter because ice closes the harbors for several months.

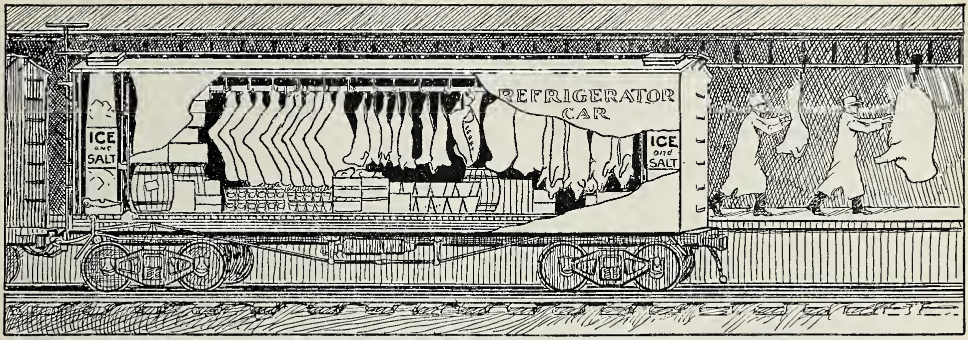


Fig. A. A refrigerator car. See where the ice and salt are packed. From the meat-packing plants (Fig. 374-A), dressed meats are shipped in refrigerator cars to all parts of our country.

The meat capital of the world. Chicago is the greatest live-stock market in the world. Fifteen million animals — cattle, hogs, and sheep — come to its stockyards every year. The cattle pens alone cover several times as much land as the Marvin farm. The packing houses near by prepare more meat for the market than is prepared in any other city in the world. Endless processions of fat cattle, hogs, and lambs walk into one end of the packing plant. At the other end their neatly dressed bodies roll on little trolleys into the cooling chambers or the refrigerator cars after passing in front of a row of men, each of whom does a certain small part of preparing the animal for market. Chicago dressed meat goes to thousands of distant butcher shops.

The packing house sells many things besides meat. Bristles are saved for brushes. Hoofs are boiled to make glue. Bone is made into knife handles and buttons. Finally, the scraps are used to make bone meal for fertilizer and food for stock.

A railroad center. From Chicago supplies are sent back to the farmers who send their crops to this city. Chicago manufactures more farm machinery than any other city in the world. Hundreds of carloads of binders, mowers, plows, harrows, and other farm machinery go out each year to the warehouses of the machinery dealers in the little towns of many distant states, and even to foreign countries. Chicago is also a great lumber market.

Chicago leads in the making of pianos and radios, and in the amount of electric fixtures, gas fixtures, and many other things used in homes and public buildings. The stores of many, many towns and smaller cities send to the wholesale houses of Chicago for the things they sell. This makes it a good place for clothing manufacturers to sell their products, and, as a result, much clothing is now made there.

The railroads that have been built to carry all this freight make Chicago the greatest railroad center in the world. Thirty-two railroads come into the city. On the average, a car of freight enters or leaves every four seconds.

Iron and steel in the suburbs. Give some reasons why the industries of Chicago use much iron and steel. Chicago has many iron and steel plants, and the largest in the world is near the southeastern edge of the city. This plant shows how good transportation helps to make industries. A steel company decided that it would make steel near Chicago, instead of sending iron and steel from Pittsburgh to Chicago. The company bought a large tract of sandy land, not very good for farming, on the

Fig. A. The downtown business section of Detroit as seen from an airplane. What river do you see in the picture? This river forms the boundary between the United States and Canada.

shore of the lake at Gary, Indiana. A harbor was dug so that vessels can go into it from the lake, and thus unload the ore or fuel or limestone beside the iron furnaces. Hoisting machinery lifts the material into the top of the furnaces, and drops it into the roaring fire. The melted iron runs out of the bottom of the furnaces. While still melted, it is carried into the great factory alongside, goes from process to process through heating furnaces and shaping rolls until carloads of steel rails, boiler plates, and many other kinds of iron and steel goods come out hundreds of feet away at the other end of the steel works.

Chicago the center of a circle. 1. Use the scale of miles on the map of the United States. Draw a circle with a radius of 800 miles and Chicago at the center. What cities are near the outside of this circle?

2. Why should people in Chicago buy goods from the East and from the West and sell goods to the East and to the West?

3. How many people live in Chicago? How does it rank in population? Why is it such a large city?

Big numbers are interesting. If fifteen cars of freight enter or leave Chicago every minute, how many cars enter or leave the city during a whole day and night?

Show how wheat travels to market.

1. Draw a free-hand map of the Great Lakes.
2. Show Buffalo and the Erie Canal route to New York City.
3. Put dots to show Fort William, Duluth, and Chicago on the lakes.
4. Draw red lines to show how wheat travels by train to the lakes and then by lake boats and canal barges to New York City.

Find me a job in Chicago. Let a child from one team say, "I'd like to work on a lake boat. What work shall I have to do?" Let a child from another team describe the work of the man on the boat. If the work is described correctly, pay the second team 5 points. Repeat with other requests for work that might be found in Chicago.

OTHER CITIES OF THE LAKE SHORE

Milwaukee. Compare the locations of Chicago and Milwaukee as places for a city to grow. Would you say they were very much alike or very different? The people of Milwaukee have made a harbor so that lake steamers can bring into the city anything that they can take into Chicago. Milwaukee is not so large a *distributing* center as is Chicago, but she is much like Chicago in her manufactures. In prosperous times, 100,000 people are working in her factories. The workers make a great many different kinds of machinery and other things. Milwaukee steam shovels dug the Panama Canal. The people of Milwaukee are proud of their government because it is so good that the city has much less crime than many other large cities have.

Detroit, the automobile capital. Chicago is the world's capital of meat, grain, and farm machinery, but Detroit is the automobile capital of the world. People often say that this is an age of machinery. It became so because we have learned to use a system that is called *standardization.* Standardization means that men keep a pattern of things that they make, and use the pattern to make many, many more things exactly like the first one. Standardization is useful in this way. If your automobile is not running satisfactorily, you take it to the local agency. The repair man examines your machine and sees that a certain part has been broken. When the broken piece was made at the factory, thousands of other pieces exactly like it were made and sent to all the local agencies. In order to repair your car, the local agent has only to look in his storeroom for a piece like the broken one. It will fit your car. In a few minutes your machine is running once more. Since we have had standardization, you can have your car repaired anywhere that you can get the necessary piece. By this most useful system, machinery can be made in Michigan or Ohio and used in Asia, Africa, Australia, or anywhere else in the world. Because of this system, harvesting machines from Chicago cut the wheat in South America, in Russia, in Siberia, in Australia. American automobiles go everywhere where there are roads, and to some places where there are none.

Detroit depends on automobiles. Automobiles are more important to Detroit than any one thing is to Chicago, because more people in Detroit work in automobile factories than on all other kinds of manufacture. Michigan has more than half of all the people in the United States who work in automobile factories. Most of these people live in Detroit and its suburbs, Dearborn, River Rouge, Hamtramck, and Highland Park, or in other cities in southeastern Michigan, such as Flint, Pontiac, and Lansing.

Detroit is well located for this industry. The lake steamers pass it on their way to and from Lake Erie. They bring the ore of western Lake Superior, lumber and copper from the upper lakes, and Appalachian coal from Cleveland and other Lake Erie ports. The city is on the edge of a level plain. Railroads run from Chicago straight through to Buffalo and on to New York. Like Chicago, Detroit is near the center of population. It is, therefore, easy to ship automobiles from Detroit to all of us.

Some automobile plants turn out finished automobiles. Others make bodies, headlights, or some small part of an automobile, and sell the parts to the companies that turn out the finished cars.

Assembling an automobile. The making of an automobile is one of the wonders

Fig. A. Part of the city of Cleveland as seen from an airplane. What lake do you see? Find the stone walls of the artificial harbor, which stop the big waves from the lake. What do you see that tells of transportation?

of the machine age. The parts come to the main factory. The building of the car starts with putting the first pieces of the frame on a moving conveyor something like a belt. A row of men stands on either side of this moving belt. As the frame goes slowly past them, each man takes some particular part and quickly bolts it fast to the moving frame, until finally the finished car rolls out the door on its own wheels, ready to be tested.

Farms decline and cities grow. The high wages paid in the automobile factories have caused thousands of men to leave their farms in parts of Michigan and many other states and get jobs in the cities.

The automobile industry grew so quickly, that for a time Detroit grew almost as rapidly as a mining camp. The number of pupils in the public schools of Detroit increased from 122,000 in 1920 to 220,000 in 1929. What population increase did Detroit have during that time (Appendix)?

Cleveland and other Lake Erie cities. Cleveland is sometimes spoken of as a lower lake port. What cities would you name as upper lake ports? Cleveland receives the products from Chicago and Duluth, and ships back to them a great variety of manufactures from her own factories and from the factories in many cities to the south and east. The chief thing she sends is coal from the mines of Pennsylvania, West Virginia, and Kentucky. Her coal docks have machinery that picks up a car loaded with coal, turns it upside down, and dumps the coal into a steamer alongside about as easily as you can empty a cup of water. You can see that such machinery can do a great deal of work with very few people. Perhaps this is the reason that Cleveland has a greater part of her people engaged in manufacturing than has any other large city in the United States. Another reason for this is that Chicago to the west of her is such a great distributing center that Cleveland, Toledo, and the other cities

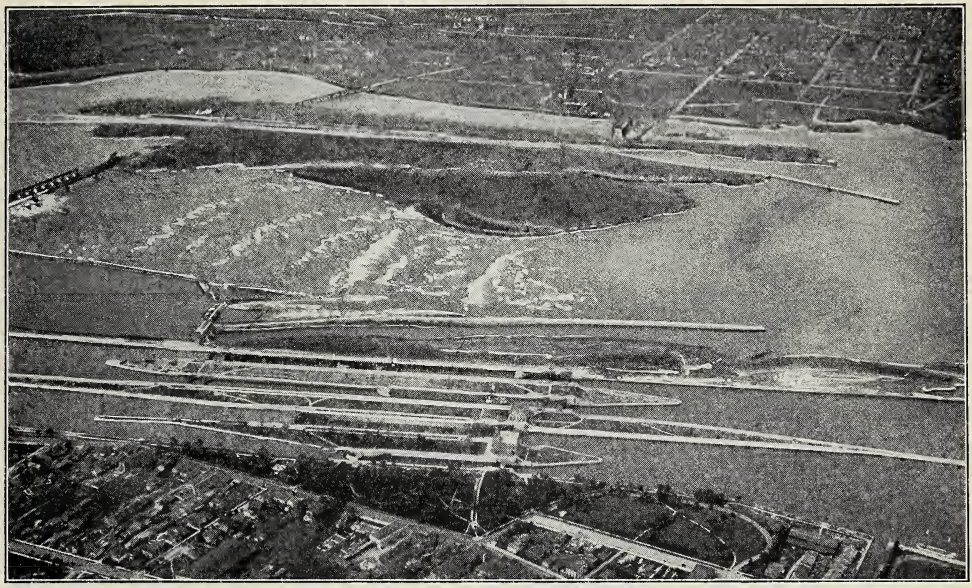


Fig. A. The Soo Canal (Sault Ste. Marie) as seen from the air. Find Canada, the rapids, the locks, a boat in the locks. Is the boat going upstream or downstream?

on Lake Erie have only a small territory near them to which their wholesale merchants can ship goods.

Cleveland and her neighboring city, Toledo, have oil refineries and many manfactures of iron, steel, and machinery. The level land of the plain along the lake shore suits these industries, which need to spread out over much land so level that railroad tracks can run in and out in any direction.

A free-hand map. With your eyes shut, you should be able to see these cities on the Great Lakes: Milwaukee, Detroit, Cleveland, Toledo, Erie, Buffalo, Chicago, Duluth, and Fort William. Draw a free-hand map of the Great Lakes, and put a dot where each of these cities is located. Change papers with your neighbor, and see if he can write the name of the city beside each dot.

The power map. 1. On an outline map of the North Central States shade in dark color the areas that have coal under them. Write on each state the figures that show the amount of coal reserves and the amount mined in a year.

2. Add the oil pipe lines (Fig. 290-A).

3. Make a mark for a dam across a big river and power plant at Keokuk, Iowa. Make a mark for the line that carries power to St. Louis.

Putting an automobile together. Draw a free-hand map of the Great Lakes. Cut out and paste a little picture of an automobile where the city of Detroit is located. Do you know what parts of an automobile are made of iron and steel? of copper? of leather? of lumber? Is coal used in the automobile factory? Draw lines of different colors to show how Detroit receives each of these materials. Write the name of each material on its line.

It would make you feel proud. If you could use these expressions in talking to your friends, you would feel proud: distributing center, wholesale merchants, standardization, age of machinery, local agency, moving conveyor, loading by gravity. Use each of them in a sentence. Read your sentences aloud to the class and let them tell whether or not you understand the meanings of the expressions.

I know a boy. He went to a junk heap and collected enough old parts to make himself an automobile. Have class discussion to show how standardization helped him.

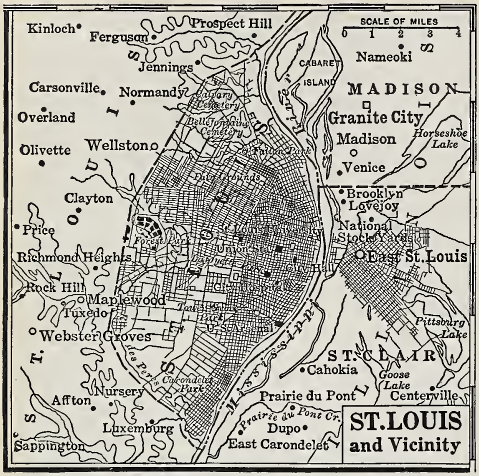


Fig. A. Find this city also in Figure 357-A.

CITIES ON THE MISSOURI AND MISSISSIPPI RIVERS

St. Louis, Kansas City, Omaha, Minneapolis, and St. Paul. On Figure 356-A and 357-A, put your thumb on Chicago, and with your finger trace a line starting at St. Louis and passing through Kansas City, Omaha, Minneapolis, and St. Paul. If Chicago is the great trading center of the North Central States, we may say that these five river cities are secondary centers. We might almost say that they are smaller Chicagos.

Is there any large city on the Mississippi River between St. Paul and St. Louis? While Chicago does the big-city work for all the territory east of the river and for some to the west of it, St. Louis, Kansas City, Omaha, Minneapolis, and St. Paul are somewhat like Chicago, because each of them also is the trade center for a wide stretch of farm land and ranch land.

Minneapolis and St. Paul supply northern Wisconsin and northern Iowa and the area that lies northwestward to the Rocky Mountains. Omaha and Kansas City send goods westward, and St. Louis sends goods southward to the Ozarks, the western part of the Cotton Belt, and the ranches of west Texas and New Mexico. Turn to the physical and political map of North America and trace with your fingers the territory that you think might be supplied from each of these four city centers, and then tell which should be the largest.

These four centers got their start because of the river on which they are located, and because of the steamboats that carried freight before there were railroads. St. Paul calls itself the *gateway to the Northwest,* and Minneapolis is the head of steamboat navigation on the Mississippi. Because Minneapolis was a boat landing at the head of navigation, it was a good place for trappers to bring furs; so it became a trading station also. For protection, a fort was built, and, as time passed, the place became a frontier settlement. After the farmers came, these cities became distributing centers also.

Where two valleys come together. Because canoes, flatboats, and then steamboats carried trade along the Mississippi and the Missouri rivers, the city of St. Louis stands near the junction of these two rivers, where it could get the trade of both valleys. On the map you will see that Kansas City and Omaha also stand close to the junction of two rivers, because the early pack trains and later the railroads that crossed the plains followed the river valleys. Easy transportation has helped to start these cities, just as it started Chicago. When railroads came, the builders naturally laid the tracks from city to city and from the city out into the country. Therefore, like Chicago, each of these four cities became a railroad center. Into each of them freight trains enter every hour of the day with long strings of cars loaded with grain, live animals, hay, minerals, and lumber from the western mountains, fruit from the

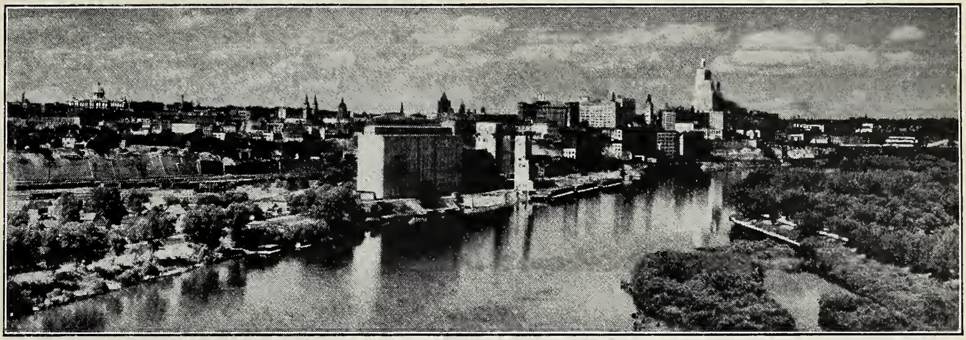


Fig. A. **A part of the city of St. Paul, capital of Minnesota. See the State Capitol at the left of the picture.**

Pacific states, and imports from the Pacific ports. Every day fast passenger trains enter these cities, change engines, and speed away on their journeys between the Pacific coast, the Rocky Mountains, and Chicago, the great railroad center. At Chicago the passengers change to still swifter trains that run to New York, Boston, Philadelphia, and Washington. Because they are railroad centers, each of these cities has many people who work in railroad shops, where they build and repair cars.

Like Chicago, each of these four centers has stockyards and an important meat-packing industry. Each receives grain and sometimes sends it on to Chicago. Each of them has many factories. Each has many wholesale stores.

Manufactures in St. Louis. Since St. Louis has so many wholesale houses, it has become a place where a manufacturer may easily sell his goods. The railroads and rivers make it an easy place for a manufacturer to get coal, iron, wool, and other raw materials; so factories have been built until more than 100,000 people work in the factories of St. Louis. Boots and shoes are important products. Eight thousand people are making clothing, and even more are making machinery. Since St. Louis can get food and raw materials easily, it has become a natural place where machinery is made and sold, because every town on the many railroads coming into this city has an agency for farm machinery and automobiles, and it has people who wish to use refrigerators, electric motors, radios, and many other mechanical things.

Botanical gardens. In 1860 a wealthy man named Shaw left some money to found a botanical garden in St. Louis. This garden now has the greatest collection of living plants, especially of trees, to be found anywhere in the Western Hemisphere. The parks consist of 75 acres in the city and 1600 acres outside the city. These parks provide the people of St. Louis with open space for play, and offer pleasure for those who like to study plants. Shaw's Garden now has a branch at Panama which collects tropical plants.

Kansas City and Omaha. These cities, like St. Louis, have a great variety of manufactures. Kansas City and Omaha are the principal markets in the world for what they call *stock* or *feeder cattle.* These cattle are not fat. They have come in by carload and trainload lots from the dry pastures on the ranches and ranges of the West and the Southwest and are sent off to Corn Belt farms to be fattened before they go on to the packing plants. Kansas City and Omaha are important

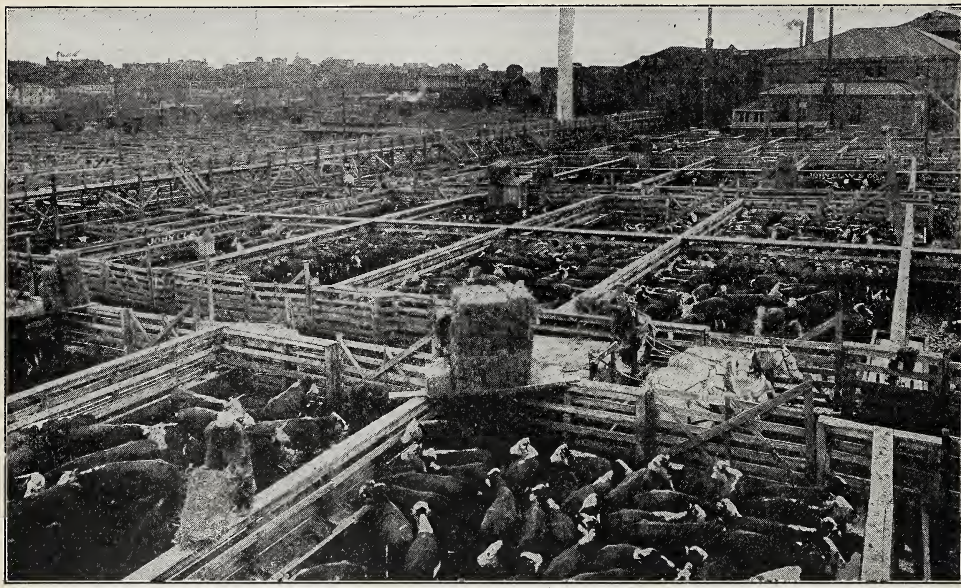


Fig. A. Stockyards, such as you see in this picture, may be found in practically all the cities of the North Central States. These yards are in Omaha. What things do you see in the picture which show the use of these yards?

markets for hay, Kafir corn, and dairy products. The manufactured goods are chiefly flour and other food products.

Minneapolis and St. Paul. We have already learned about the greatest single industry in Minneapolis (page 366). Minneapolis mills also make breakfast foods. The nearness to the flax fields of the Spring Wheat Belt makes it the world's greatest market for linseed (flaxseed), linseed oil, and oil cake.

Minneapolis is sometimes called *the city of lakes* because, due to the work of the glaciers (page 354), it has eleven lakes within the city limits. The city has fine art museums, schools of music, and so many parks that there is one acre of park for every ninety people within the city. Its streets are well swept and it is one of the cleanest cities in the United States.

Across the river from Minneapolis is St. Paul, the capital of the state. It is much like Minneapolis in trade and manufacture. St. Paul is one of the greatest butter manufacturers in the world. It, too, is a beautiful and healthful city.

The two cities of St. Paul and Minneapolis touch each other so that you cannot tell when you leave one and enter the other. They are frequently called the *Twin Cities*.

Make a trade-area map. 1. On a blank map of the North Central States write initials to stand for Chicago and for the four centers of population which we have just studied.

2. Open the arms of the compass 400 miles by the scale and draw a colored circle with Chicago at the center.

3. Open the arms of the compass 200 miles by the scale and draw different colored circles with each of the four river centers at the center of a circle. Tell something about these circles.

4. Point to the area that may be supplied by only one city; by two or more cities.

5. Tell why you think the early explorers and the pony express traveled along the rivers in the Great Plains.

Quadruplets. As four brothers may be much alike, these four river cities are alike. How are they alike? How different?

OHIO RIVER CITIES AND CITIES OF THE INTERIOR

Are Ohio River cities like Missouri River cities? There are no great stretches of grain fields and ranches back of the Ohio River to send produce to Ohio River cities and to make them distributing centers with far-reaching trade. More of the people in Ohio River cities make their living in factories than in stores, warehouses, railroad shops, and freight yards. In this respect the people of the Ohio River towns are much like those in many cities that lie between the Ohio and the Great Lakes.

Cincinnati has many industries. What does Figure 357-A tell you about how Cincinnati can get coal and iron very cheaply by boat down the river from Pittsburgh? Cincinnati also has good clay to make pottery. It has many machine shops with a great variety of manufactures.

Cities with few industries. In its variety, Cincinnati differs very much from the city of Youngstown and its neighbors, Warren, Ohio, and New Castle, Pennsylvania. These three cities are on the route between Pittsburgh, the great iron and coal center, and Cleveland, the port through which comes iron ore from Lake Superior. Youngstown specializes in iron and steel, much as Detroit specializes in automobiles. Nearly two thirds of Youngstown's workers are in some of the iron and steel plants, which make many articles of iron and steel, such as pipes, steel plates, the thin sheets of steel covered with tin, which we call *tin* and which are used for making tin cans. Metal laths used in houses are also made here.

Machinery, machinery. The workers of Youngstown use heavy machinery. They send out stuff by the carload. But the people of Dayton have very different jobs. They specialize in fine, light machinery. The cash registers that they make go to almost as many countries as do the automobiles of Detroit. The skilled workers of Dayton make grocer's scales; they make the machines on which we see trolley-car fares recorded; they make many other kinds of fine machinery and electric refrigerators, all of which are very valuable when made and must go out neatly packed in boxes for careful handling.

The rubber of Akron. The people of Akron, Ohio, are not interested in pipes, like the people of Youngstown, or in fine machinery, like those of Dayton, except as they use such things in their rubber factories. Akron shows us how it is that one man making an article starts his factory beside that of another man who is already making it. One of the reasons he does this is that there are people in the neighborhood who know how to do the work. In 1869 a man named Goodrich started a rubber factory in Akron, Ohio. Now Akron is the rubber and tire capital, just as Detroit is the automobile capital, and Chicago the meat capital of the world. Akron has twenty companies making rubber goods — more rubber goods than are made in any other two cities in the world. Akron uses more than a third of all the world's supply of crude rubber. It makes automobile tires by the million. Automobiles came into use so quickly that, between 1910 and 1920, Akron grew even faster than Detroit grew. Fifty thousand people work in rubber in this one city. They make 30,000 kinds of articles, from a little rubber band to a giant dirigible.

Indianapolis and some other state capitals. Indianapolis is an industrial city. It is like Cincinnati in having many kinds of manufactures, no one of which is more important than any one of several others.

For a long time Indianapolis was known as the largest city in the United States, or even in the world, that was not reached by boats carrying freight. The state legislature made it the state capital. The state capital brought many people there to live. The railroads made it a good place for factories, and so it is the largest city in the state.

Columbus, the capital of Ohio, like many other cities of Ohio and Indiana, is a center from which a number of railroads extend in many directions across the level plain. These roads bring cheap coal, cheap iron, and help the people in these inland cities to make many kinds of manufactures. Machinery is a very important product of these inland cities — machinery to use in factories, machinery to use on farms, and machinery to use in homes and stores, also steam shovels, steam rollers, and grading machines for the contractors who build roads. When we think of the automobiles and all of the other kinds of machinery that are made and used in the North Central States, we may indeed say that this is the *land of wheels.*

Farther west the state capitals, Madison, Lincoln, Des Moines, Topeka, Jefferson City, and Springfield, are smaller cities in which the state government is the most important single reason why people live in the city.

Future. To think of the future of the North Central States, think of the future of the United States. Our people will keep on wanting machinery, and the North Central States will keep on making it. Their coal supply will last for centuries with care. They are already using imported wood, and if need be the improved St. Lawrence waterway will let them bring imported iron ore to the ore docks now in use. If we learn better how to let people work and exchange their goods, the North Central States can make even greater quantities of automobiles and other machinery for the people of other sections of the United States. If we encourage trade with other nations, the North Central States can export machinery in the future as they have in the past.

Our people will keep on wanting bread and meat, butter and cheese, eggs and poultry, and a hundred years from now we may expect most of these farms to be still producing grain, meat animals, milk, and fowls. A hundred years hence we may expect a larger lumber production than at present, because we shall then have learned to protect our forests from fire as the people in Europe do.

If the cities are to keep prosperous, there are two tough questions we must settle quickly. One is how to keep the western lands from blowing away, and the other is how to cultivate sloping fields and not have them wash away. The Soil Erosion Service, U. S. Department of Agriculture, Washington, D. C., has interesting bulletins on these subjects.

I am a city. Say I am Chicago. I ——. Do this for six lake cities, six river cities, six inland cities.

Two-minute conversations. Let each child choose a partner; let the two partners prepare to carry on a two-minute conversation on any of the following subjects:

1. The work of the corn grower in Iowa.
2. The work of the glacier in the North Central States.
3. Roads and waterways in the North Central States.
4. Butter and cheese making in the North Central States.
5. Fruit growing on the Lake Plains.
6. Lumbering around the Great Lakes.

An experiment. Take two cans that are alike. Fill one with hot water and the other with hot, dry sand. Put a thermometer in each and keep a record of the temperatures.

Read each thermometer every five minutes until you have six or eight different temperature readings. Make a table showing the differences. What does this experiment explain?

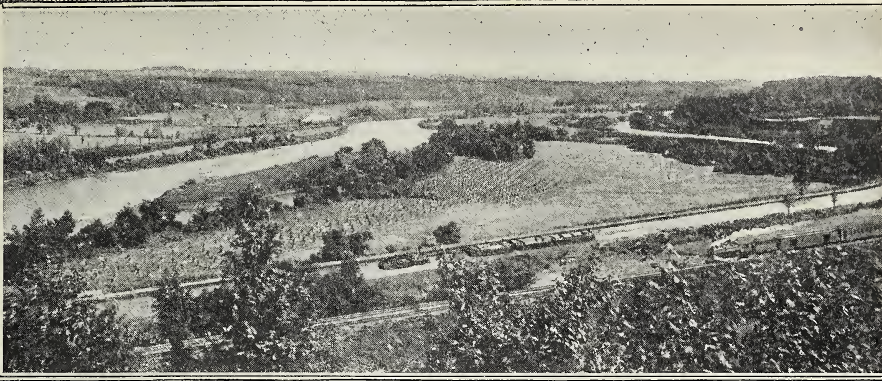


Fig. A. The Mohawk Valley, one of the great natural highways in the Northeastern States. You are looking toward the gap (Mohawk Gap) which the river has cut through the highlands. See the New York State Barge Canal and the railroads which use the level land beside the river.

THE NORTHEASTERN STATES

LAND IN WHICH THE OCCUPATIONS OF THE PEOPLE WERE MADE OVER

As you read this chapter, think of changes. On the maps (Figs. 386-A and 387-A) read the names of the nine Northeastern States.

You remember from your history that Massachusetts was settled in 1620. Within a few years of that time, all the Northeastern States that touch the Atlantic were settled by people from Europe. For almost two hundred years all the white people in the United States lived in the narrow strip between the Atlantic Ocean and the Appalachian Mountains. To them and to the people of Europe, North America meant little more than the Atlantic slope. The settlers, their sons, their grandsons, and their great-grandsons were farmers, even though much of the land was rocky and hilly and they had to work hard to make a living.

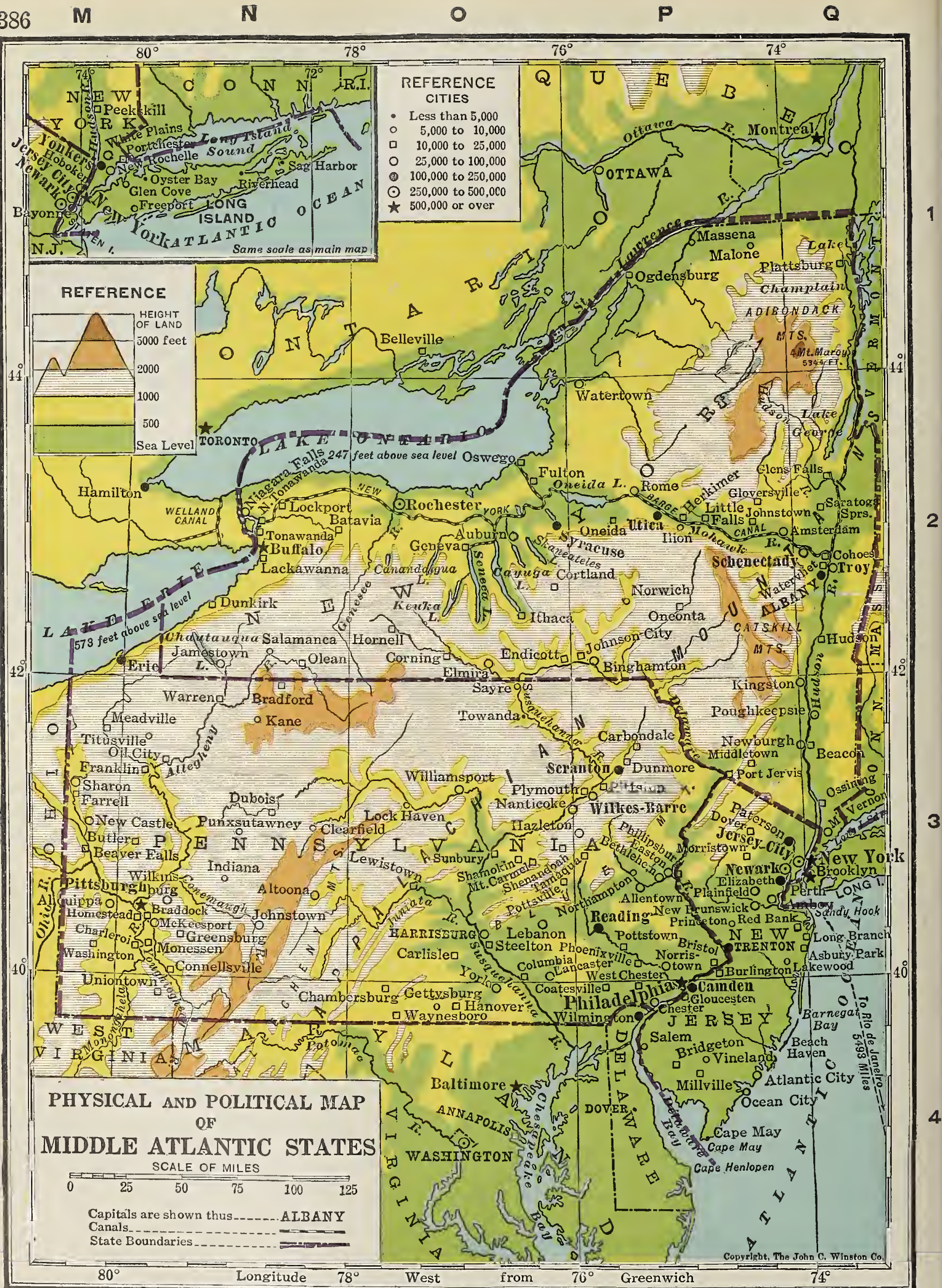
For 150 years these farmers and villagers lived with little change in their industries. But in the last 150 years, great changes have come about. Instead of being lands where everyone is a farmer, the Northeastern States are dotted with towns. Find from the Appendix what fraction of the people live in cities. What has brought these changes?

SAILORS, SETTLERS, AND PEDDLERS

Farmers go fishing. What caused this change from farms to cities? The codfish helped to build towns, as you will see.

In the days of the early settlement of America, dried codfish was one of the important things from New England that Europeans wanted. Therefore some of the colonist farmers went fishing when their crops did not need their attention. Taking the dried codfish to market caused the people to become traders. After they became traders, they became manufacturers so that they might have more things to sell. This chapter will tell you how these things happened.

Fishing today. European fishermen caught cod off Newfoundland for over a hundred years before Canada was settled. In fact, they still catch them, for



M
N
O
P
Q
1
2
3
4
80°
78°
76°
74°
44°
42°
40°
REFERENCE
CITIES
Less than 5,000
5,000 to 10,000
10,000 to 25,000
25,000 to 100,000
100,000 to 250,000
250,000 to 500,000
500,000 or over
REFERENCE
HEIGHT OF LAND
5000 feet
2000
1000
500
Sea Level
NEW YORK
CONN.
R.I.
N.J.
Peekskill
White Plains
Portchester
New Rochelle
Yonkers
Hoboken
Jersey City
Newark
Bayonne
Oyster Bay
Glen Cove
Freeport
New York
Long Island Sound
Sag Harbor
Riverhead
LONG ISLAND
ATLANTIC OCEAN
Same scale as main map
QUEBEC
Ottawa R.
Montreal
OTTAWA
St. Lawrence R.
ONTARIO
Belleville
TORONTO
Hamilton
WELLAND CANAL
LAKE ONTARIO
247 feet above sea level
LAKE ERIE
573 feet above sea level
Niagara Falls
N. Tonawanda
Lockport
Tonawanda
Buffalo
Lackawanna
Dunkirk
Massena
Malone
Plattsburg
Lake Champlain
Ogdensburg
ADIRONDACK MTS.
Mt. Marcy 5344 FT.
Watertown
Lake George
Oswego
Fulton
Oneida L.
Rome
Herkimer
Glens Falls
Gloversville
Saratoga Sprs.
Little Falls
Johnstown
Amsterdam
Rochester
Batavia
NEW YORK BARGE CANAL
Auburn
Geneva
Syracuse
Skaneateles L.
Oneida
Utica
Ilion
Mohawk R.
Schenectady
Cohoes
Troy
Watervliet
ALBANY
Canandaigua L.
Seneca L.
Cayuga L.
Cortland
Norwich
Keuka L.
Genesee R.
Ithaca
Oneonta
CATSKILL MTS.
Hudson
Chautauqua L.
Salamanca
Hornell
Johnson City
Jamestown
Olean
Corning
Endicott
Binghamton
Elmira
Erie
Kingston
Sayre
Warren
Bradford
Kane
Towanda
Poughkeepsie
Hudson R.
Meadville
Titusville
Oil City
Allegheny R.
Carbondale
Newburgh
Middletown
Beacon
Franklin
Scranton
Dunmore
Port Jervis
Williamsport
Sharon
Farrell
Dubois
Plymouth
Nanticoke
Wilkes-Barre
Ossining
Mt. Vernon
Lock Haven
New Castle
Punxsutawney
Clearfield
Hazleton
Paterson
Dover
Jersey City
Butler
PENNSYLVANIA
Morristown
Beaver Falls
Lewistown
Sunbury
Phillipsburg
Easton
Bethlehem
New York
Brooklyn
Newark
Elizabeth
Indiana
Shamokin
Mt. Carmel
Shenandoah
Tamaqua
Plainfield
Perth Amboy
Wilkinsburg
Altoona
Pottsville
Northampton
Allentown
Aliquippa
Pittsburgh
Braddock
Homestead
McKeesport
Conemaugh R.
Johnstown
New Brunswick
Princeton
Red Bank
Sandy Hook
Juniata R.
Reading
Charleroi
Greensburg
HARRISBURG
Lebanon
Pottstown
NEW JERSEY
Long Branch
Monessen
Washington
Steelton
Phoenixville
Bristol
TRENTON
Asbury Park
Carlisle
Norristown
Connellsville
Columbia
Lancaster
West Chester
Burlington
Lakewood
Uniontown
York
Coatesville
Philadelphia
Camden
Gloucester
Chambersburg
Gettysburg
Hanover
Chester
Waynesboro
Wilmington
Barnegat Bay
WEST VIRGINIA
Monongahela R.
Potomac R.
MARYLAND
Salem
Bridgeton
Vineland
Beach Haven
Baltimore
Millville
Atlantic City
Ocean City
ANNAPOLIS
DOVER
DELAWARE
Delaware Bay
Chesapeake Bay
Cape May
Cape Henlopen
WASHINGTON
VIRGINIA
ATLANTIC OCEAN
To Rio de Janeiro 5493 Miles
VERMONT
MASS.
CONN.
OHIO
Ohio R.
PHYSICAL AND POLITICAL MAP OF MIDDLE ATLANTIC STATES
SCALE OF MILES
0
25
50
75
100
125
Capitals are shown thus ALBANY
Canals
State Boundaries
Copyright, The John C. Winston Co.
80°
Longitude
78°
West
from
76°
Greenwich
74°

Fig. A

HU-1

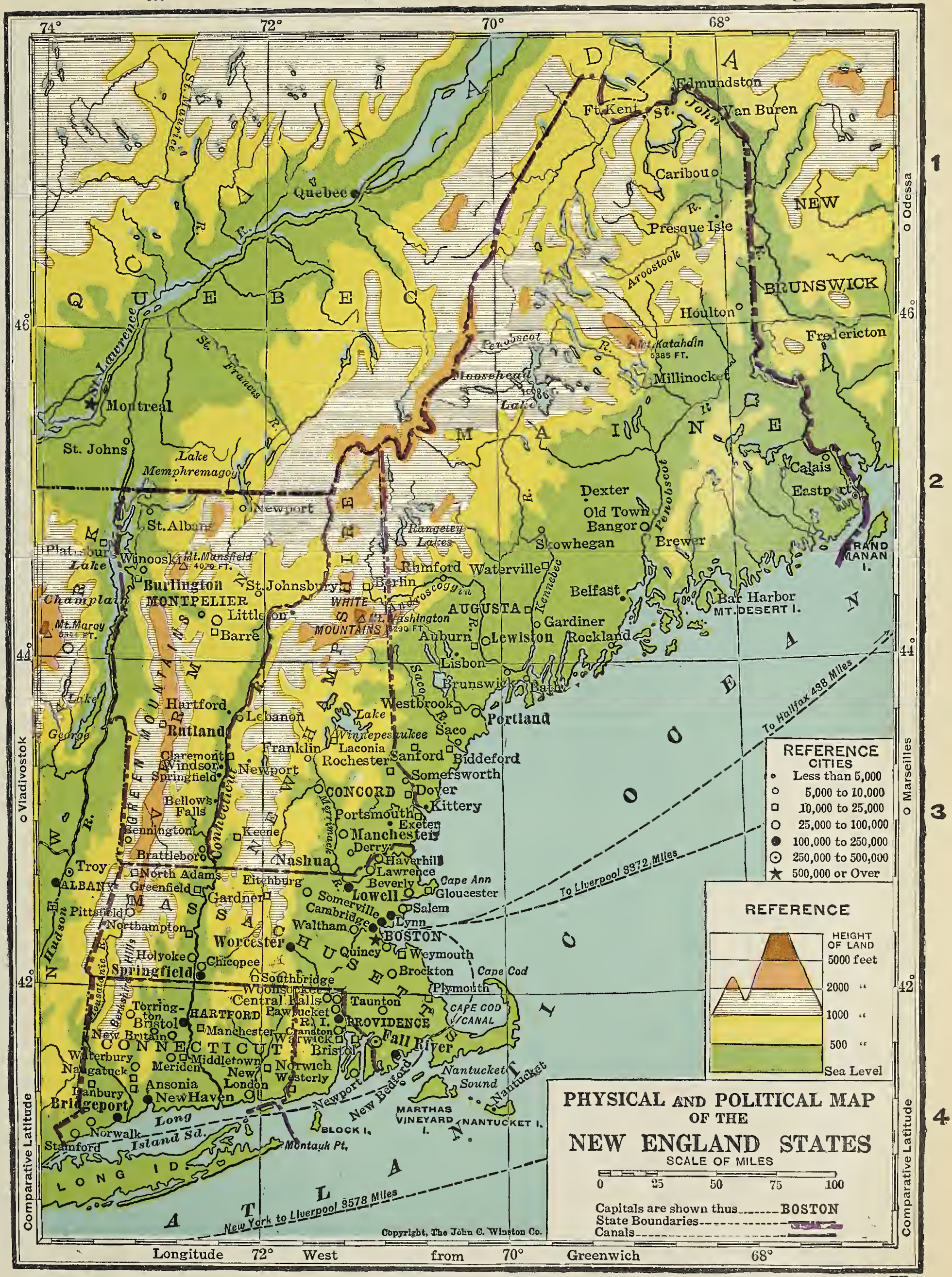

M
N
O
P
1
2
3
4
74°
72°
70°
68°
46°
44°
42°
PHYSICAL AND POLITICAL MAP OF THE
NEW ENGLAND STATES
SCALE OF MILES
0 25 50 75 100
Capitals are shown thus BOSTON
State Boundaries
Canals
Copyright, The John C. Winston Co.
REFERENCE
CITIES
Less than 5,000
5,000 to 10,000
10,000 to 25,000
25,000 to 100,000
100,000 to 250,000
250,000 to 500,000
500,000 or Over
REFERENCE
HEIGHT OF LAND
5000 feet
2000 "
1000 "
500 "
Sea Level
Longitude 72° West from 70° Greenwich 68°
Comparative Latitude
o Vladivostok
o Odessa
o Marseilles
CANADA
QUEBEC
NEW BRUNSWICK
MAINE
NEW HAMPSHIRE
VERMONT
MASSACHUSETTS
CONNECTICUT
R. I.
NEW YORK
ATLANTIC OCEAN
GREEN MOUNTAINS
WHITE MOUNTAINS
Mt. Washington 6290 FT.
Mt. Katahdin 5385 FT.
Mt. Mansfield 4070 FT.
Mt. Marcy 5344 FT.
Quebec
Montreal
St. Johns
Edmundston
Ft. Kent
Van Buren
Caribou
Presque Isle
Houlton
Fredericton
Millinocket
Calais
Eastport
Dexter
Old Town
Bangor
Brewer
Skowhegan
Waterville
Belfast
Bar Harbor
MT. DESERT I.
GRAND MANAN I.
AUGUSTA
Gardiner
Rockland
Rumford
Berlin
Auburn
Lewiston
Lisbon
Brunswick
Bath
Westbrook
Portland
Saco
Biddeford
Sanford
Somersworth
Dover
Kittery
Portsmouth
Exeter
Rochester
Laconia
Franklin
CONCORD
Manchester
Derry
Nashua
Keene
Newport
Claremont
Lebanon
Littleton
St. Johnsbury
Barre
MONTPELIER
Burlington
Winooski
St. Albans
Newport
Hartford
Rutland
Windsor
Springfield
Bellows Falls
Bennington
Brattleboro
Plattsburg
Troy
ALBANY
North Adams
Greenfield
Pittsfield
Northampton
Holyoke
Chicopee
Springfield
Westfield
Gardner
Fitchburg
Worcester
Southbridge
Lowell
Lawrence
Haverhill
Beverly
Gloucester
Cape Ann
Salem
Lynn
Somerville
Cambridge
Waltham
BOSTON
Quincy
Weymouth
Brockton
Plymouth
Cape Cod
CAPE COD CANAL
Taunton
Fall River
New Bedford
Woonsocket
Central Falls
Pawtucket
PROVIDENCE
Cranston
Warwick
Bristol
Newport
Westerly
Norwich
New London
Manchester
HARTFORD
Bristol
Torrington
New Britain
Middletown
Meriden
Waterbury
Naugatuck
Ansonia
New Haven
Danbury
Bridgeport
Norwalk
Stamford
Long Island Sd.
LONG ID.
Montauk Pt.
BLOCK I.
MARTHAS VINEYARD I.
NANTUCKET I.
Nantucket Sound
Lake Champlain
Lake George
Lake Memphremagog
Moosehead Lake
Rangeley Lakes
Lake Winnepesaukee
St. Lawrence R.
St. Maurice R.
St. Francis R.
St. John R.
Aroostook R.
Penobscot R.
Kennebec R.
Androscoggin R.
Saco R.
Merrimack R.
Connecticut R.
Housatonic R.
Hudson R.
Berkshire Hills
To Halifax 438 Miles
To Liverpool 3372 Miles
New York to Liverpool 3578 Miles

Fig. A

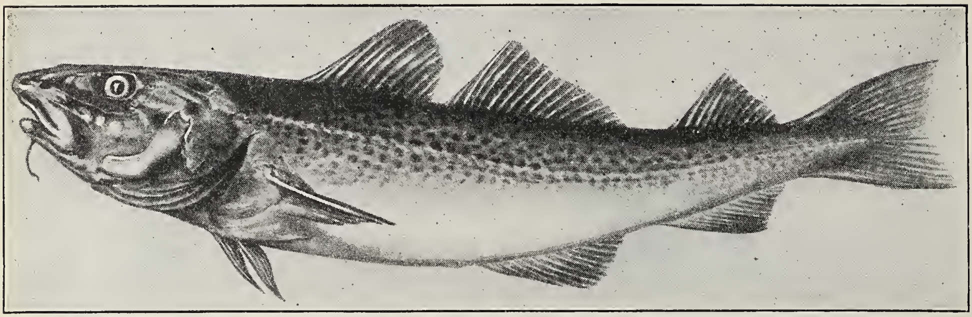


Fig. A. A thirty-pound codfish.

there are shallow places (*fishing banks*) off the coast of eastern North America, and the market for dried codfish is good. If no one wants to eat codfish today, the dried fish will keep until next year. See whether there is not some dry codfish in your grocery store.

Sometimes the fishermen from Massachusetts go several hundred miles, all the way to Newfoundland, to catch fish. They take salt or ice with them to use in keeping the fish from spoiling. Mackerel, herring, bluefish, and lobsters are also caught along the coast of New England and eastern Canada. At some places the fish are canned.

Many of the people in Gloucester, Massachusetts, are busy all the time catching fish, salting them, or fixing their fishing tackle. Down near the wharves of Gloucester, one can always smell fish. Many fishing boats go out from Boston, Marblehead, and Portland, and from many small towns along the Maine coast. In recent years Boston has become the greatest fishing center in New England. One reason is that the people of this big city eat many of the fish. Another reason is that there is a new way of marketing the fish.

As soon as the fishing boat unloads its cargo at the Boston fish wharf, the fish are cleaned, the big bones are taken out, and each half of a fish is wrapped in waterproof paper, so that the grocer can pick up the package and hand it over the counter to a housewife. Tubs of these ready-to-cook fish are packed in ice, carried out of Boston every day in refrigerator cars to hundreds of towns, many of which are far inland.

Fishermen become traders. The fishing business helped to make traders of the early New England colonists. They had to build good, strong boats, for the sea here is very rough and stormy. They invented a kind of sailing boat called a *schooner*. Sometimes they sailed in their good, strong boats to England, or down to the West Indies, to sell fish and bring back English goods or West Indian sugar and molasses. The people in the West Indies wanted lumber also, and the New England forests furnished it for them. As ships went out every year with fish and lumber, the traders began to take shoes that the shoemaker had made, tinware from the tinsmith, clocks from the clock maker, guns from the gunsmith, and knives from the blacksmith. The fishermen's ships gave the New England artisans a chance to sell the things they made by hand in their farm and village homes and shops. For these reasons New England got an earlier start than any other part of

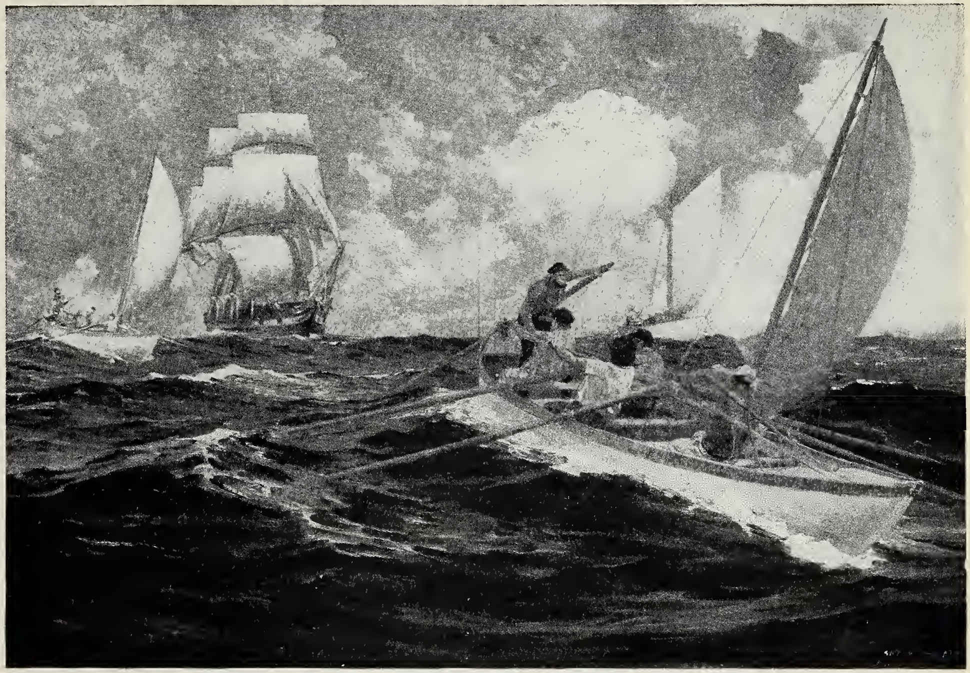


Fig. A. After you have read the paragraph about whalers and clipper ships, tell about this picture.

the country at manufacturing for distant markets.

Whalers and clipper ships. Some daring New Englanders sailed out to sea to fish for whales. When the man on lookout at the masthead sighted a whale, men in a small boat put out from the whaling ship, rowed quietly up to the whale, and the man in the bow of the boat threw his harpoon (a spear with a rope attached to it) into the whale. The whale plunged and swam and pulled the little boat about until he wore himself out and could be captured. A New England whaleboat captain, named Folger, made the first map of the Gulf Stream. It was printed by Benjamin Franklin, and is still a good map of the Gulf Stream.

In the early part of the nineteenth century the port of Nantucket, on Nantucket Island, and New Bedford, on the south coast of Massachusetts, had whaling ships on almost every sea.

About this time other Yankee workmen built very fast ships, called *clipper ships*. They were built to make long journeys. In them the New England traders made journeys to China and India, bringing back tea and spices, and for a time Salem, Massachusetts, was a more important port than Boston. But that was long ago. The Salem harbor is too shallow for the big ships of today. Modern ships take most of the sea trade of New England to Boston and to Portland, Maine.

The peddler starts manufacturing. Not only did men in ships help to start New England toward town life and manufacturing, but the peddler also helped. Farmers had little work to do in winter. Sometimes they would buy a quantity of pots, pans, axes, cowbells, door latches, and

Fig. A. A New England peddler selling his wares.

other articles that the blacksmiths had made in their shops. Each would load some of these articles into his farm wagon, or sleigh, or put them on a pack horse, and set out to sell the things. He would call at farmhouses along the way to sell to the housewives. Often the farmer-peddler made a long journey before he had sold everything. When railroads came, trading with distant parts of the country was made easy. Then village blacksmiths could not make things fast enough to supply the demand, and hardware factories were built. Today Connecticut has a great hardware industry. Thousands of people are employed in making these goods in the factories of Bridgeport, Waterbury, Hartford, and other towns.

The textile factory comes. The New Englanders, with ships sailing on every sea and peddlers carrying hardware into other states, gave a warm welcome to Mr. Samuel Slater. He came from England in 1790, and showed the American people how to make machinery that would make cotton cloth. Soon boats went to Charleston and Savannah to get cotton which was made into cloth in the mills of New England. When the boats went south after more raw cotton, they took along some of the cotton cloth, and knives, and many other manufactured goods. New England became the factory for the South.

A map to help you study. On a blank map of the New England States, print neatly the abbreviation of the name of each state. Find the population of each state (Appendix), and write the number below each abbreviation. Along the margin of your map write a list of the full names of these states. Put dots and initials on your map to show the location of these cities: Gloucester, Boston, Marblehead, Portland, Nantucket, New Bedford, Salem, Bridgeport, Waterbury, and Hartford. Add the full names of these cities to the list in the margin of your map.

Something about the sea. 1. Write a paragraph (a) containing these words about New England fishing and trading: fishing banks; schooner; clipper; artisans; farmer-peddler; dried. (b) About whaling and trading; whaler; clipper; harpoon; China and India; Gulf Stream.

2. Ask your teacher to read aloud Longfellow's poem, "The Wreck of the Hesperus." Where would you build lighthouses?

A complete story in six sentences. Write a sentence containing each of these:

1. Fishermen caught cod
2. Selling fish abroad
3. Built schooners and clippers
4. Use spare time to make more articles
5. Trading homemade articles
6. Manufactured goods in factories

Four families of cities. Name two cities that began with the whaling industry; two that began with trading; four that began with fishing; three that began with the blacksmith industry. There are ten of these old cities; find them all on your map, in the first exercise. With what did the place where you live begin?

Acting some scenes. Appoint a committee to plan and give some scenes from early New England life. As characters, have farmer, fisherman, trader, peddler, factory workers. The pictures will help you to plan.

For willing workers. 1. You will enjoy looking for clipper ships in the encyclopedia or in a history or reference book.

2. Bring to class newspaper and magazine clippings, letters, and pictures that tell about any part of the Northeastern States.

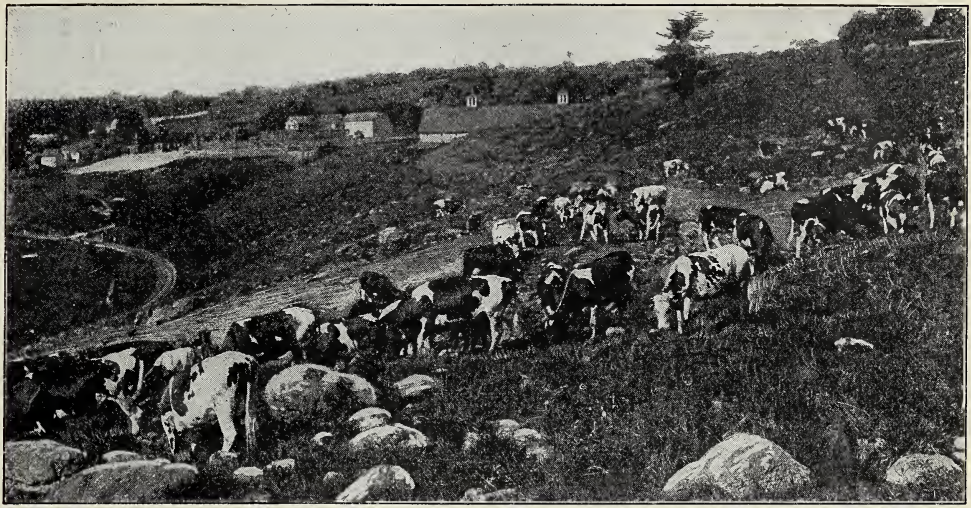


Fig. A. Because land in the Mississippi Valley was cheap, free of stones, and level, many New England farms were abandoned. Now these farms pasture many dairy cattle and supply milk and butter to the New England cities.

THE FARMERS EAST AND WEST

The farmers go west. When the Revolutionary War was over, the new country, called the United States of America, owned all the land as far west as the Mississippi River and as far north as the Great Lakes. You have already learned how the colonists had filled up the Atlantic coast. Now the settlement of the West began. The young men of Virginia went west, as did the young men of Maryland, Pennsylvania, New Jersey, New York, Massachusetts, and other New England States. There are many counties in Virginia between the Chesapeake Bay and the Appalachian Mountains, and also counties in several other Eastern States, that have no more people now than they had in 1790 or 1800. Some counties had more people then than now.

If you trace the history of the families of America, you will find that some families have lived in half a dozen places. First in Massachusetts, then Vermont, then New York, then Michigan, then Wisconsin, then Dakota, then California or Oregon or Washington State. There is a city of Portland in Maine, and a Portland, Oregon; a Salem in Massachusetts, and a Salem in Oregon, and thirty-three more Salems scattered across the United States.

The land the farmers left. Do the maps (Figs. 386-A, 387-A) show you large areas of land in the Northeastern States having the same elevation colors that you find in the North Central States? Examine the three maps very carefully in order to answer this question.

The Northeast has no large areas of level land like the Corn Belt. It has no very high mountains like those of the Western States, although most of its surface is either mountainous or hilly.

The climate also differs from that of the West (Fig. 393-A and rainfall map of U. S.).

The kind and unkind glacier. The glacier, which was so kind to the Corn Belt, was both kind and unkind to the Northeastern States. Figure 355-A shows that the glacier covered all of New England States and New York and parts of Penn-

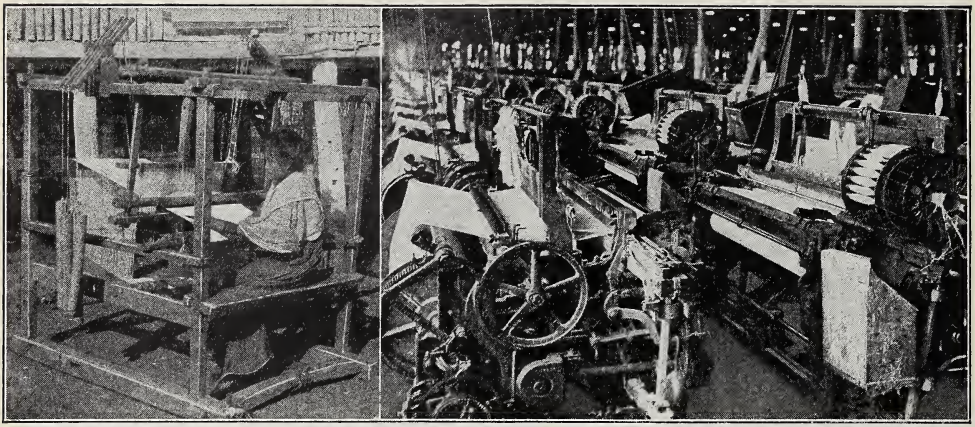


Fig. A. Weaving cloth on a hand loom as is still done in some parts of the world, and on power looms as is done at Fall River and other New England cities. The power looms are practically automatic. One person looks after many looms—twenty, forty, sometimes even more than that.

sylvania and New Jersey. As it came across the mountains of northern New England, it picked up millions and millions of wagonloads of stones and scattered them over most of southern New England. To this day New England is a stony land and not nearly so good for the plow as is the smoother land of the South and of the Corn Belt. New Jersey and Pennsylvania, south of the glacier's path, are much like the other part of the Atlantic Coastal Plain, the northern Piedmont, and the Appalachian Mountains and Plateaus which we have already studied.

Crops in the West make cities in the East. The sons of the Northeastern States who went west made farms and built towns in the new states. The men who were clearing the forests of Ohio and Michigan, plowing the prairies of Illinois, Iowa, or Dakota did not manufacture in the early days. They grew crops and shipped them to the East. With the money received for crops, they bought the things they needed from the eastern factory towns. Have a class discussion to prove the point that the farmers of the West helped to build up towns in the older states back East.

Then, as the town grew, the sons of the Northeastern States no longer needed to go west to get farms to make jobs for themselves. Instead they went to town, where most of them got jobs in the factories, and some with export or import merchants.

Early in the morning the factory whistle now blows a long, loud blast in hundreds of towns and small cities in New England or the Middle Atlantic States. That whistle can be heard for miles. It calls the workers from sleep. A little later the whistle blows again. Thousands of workers start for the factories. At another toot from the whistle, all go to work at their machines. Our map would be too crowded if we tried to show all the cities. In no other part of North America do so many of the people live in cities. What are the names of the six New England States (Fig. 387-A)? of the three Middle Atlantic States (Fig. 386-A)? Make a list of twenty cities in these states.

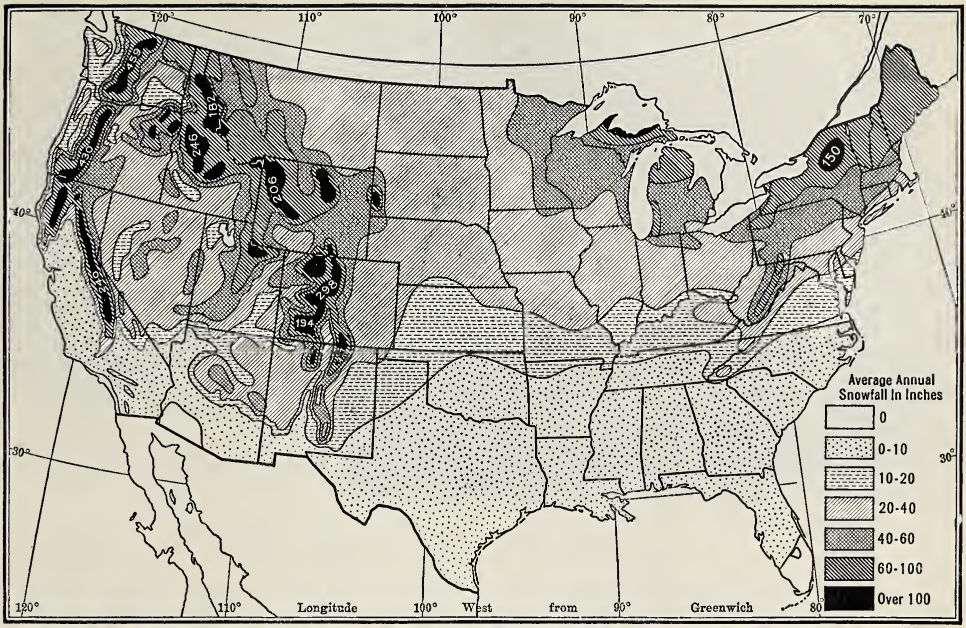


Fig. A. **Snowfall in the United States. If all the snow which falls in a year should remain on the surface of the ground and not melt, it would cover the ground to the depth shown on this map. Can you find mountains?**

The map and the population. 1. In one column make a list of the groups of states in the order of their size (Appendix).

2. In a second column make a list of the groups of states in the order of density of population (Appendix).

3. In a third column write the percentages of people who live in cities in Massachusetts; Rhode Island; Maine; New York; in your state.

Some conversations. Let two members of the class make up a conversation between a New England farmer and his twenty-year-old son, who talk about the country beyond the Appalachians:

1. At the time of the Revolutionary War
2. In 1870
3. Now
4. About good things and bad things that glaciers have done in our country.

A picture study. Find some pictures of New England farms; find some pictures of North Central farms. How do the pictures explain why eastern farmers moved west?

WATER POWER AND CENTERS OF MANUFACTURE

Many small cities. New England has many small cities as well as several large ones. This is because most of the manufacturing cities have grown up around waterfalls and harbors. Because there are so many waterfalls and so many harbors, there are a great many cities in this part of our country.

The glacier helps to turn factory wheels. The glacier cursed New England and northern New York with stones to hurt farming, but it blessed the same lands with waterfalls to turn the factory wheels. The glacier dumped dirt and stones across the valleys of the many rivers. When the glacier went away, the country was dotted with lakes, and the water tumbled in falls over the moraines and dams that the glacier had built across the valleys. The lakes store the water, and therefore

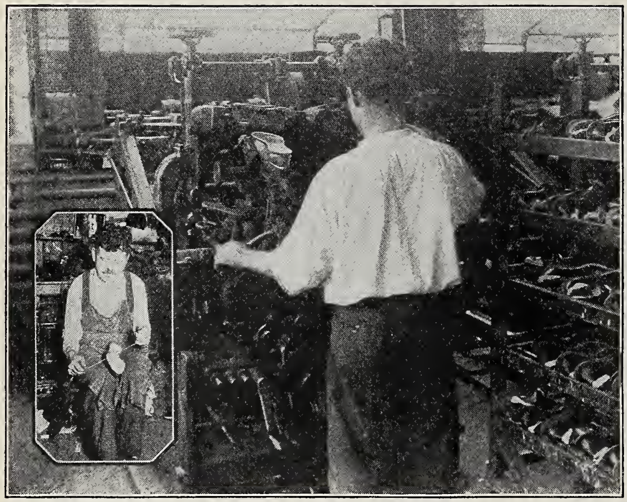


Fig. A. The drawing above suggests that a great number of people are required to make one shoe — in fact, 210 different operations are required in the making of some shoes.

Fig. B. The cobbler, old style, made a complete shoe. The cobbler, new style, in the larger picture at the left, is operating a sole-leveling machine. Which task represents division of labor?

the streams flow more evenly than streams that do not drain lakes. On the Merrimack River you can find at least five cities, each of which is located near a waterfall that turns the wheels in factories where hundreds work. Holyoke, in Massachusetts, has a whole nest of factories turned by the power of the Connecticut River, where there is a series of falls. Dozens of other such places can be named. Many of these manufacturing cities have grown so large that they have to use coal from the Appalachian Mountains for a part of their power.

Factories get together in groups. The manufactures of New England have a habit of being in centers where most of the factories of a town and of neighboring towns are making the same kind of goods. Why is this? If you want to start a new shoe factory, can you do it more easily in some little town in the Corn Belt, or in Brockton, a shoe-manufacturing center in Massachusetts? What are Brockton's advantages? Brockton stores keep the supplies which a shoe manufacturer needs. You will want men who know how to use shoemaking machinery. There are thousands of them in Brockton. If the machinery breaks, there are men in Brockton who know how to repair it and have the parts with which to do it. Merchants who wish to buy shoes to sell again all know Brockton. If you were a shoe worker wanting a job, you had better look in Brockton, because it has fifty factories where you might find work. The western town has none of these things. You see, there are many reasons why both employer and worker want to stay in a well-known center of manufacture. We shall find many such centers as we study the different manufactures of the world.

Shoes. Long ago, when the Connecticut farmers were peddling the blacksmith's goods around the country, a few cobblers made shoes in a village in eastern Massachusetts. A peddler took some of the shoes away to sell. This started the shoe industry, and, later, factories were built and machines were made to do the work. Most of the shoemaking is centered in eastern Massachusetts, where the cities of Brockton and Lynn are very important shoe-manufacturing centers. Shoes are also made in the neighboring cities of

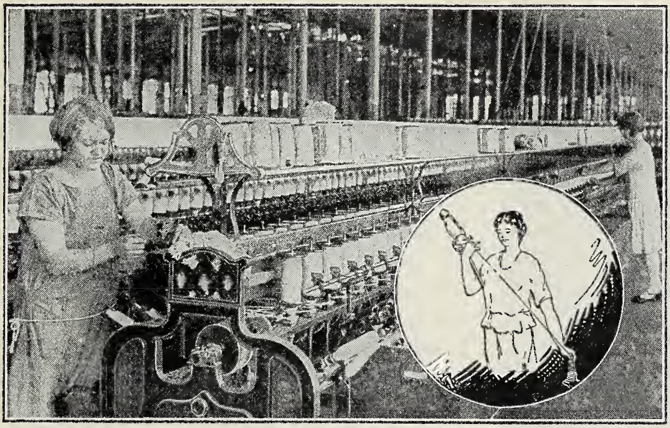


Fig. A. Spinning, old style, by use of the spinning wheel.
Fig. B. Spinning, new style, by use of large spinning machines such as you see in the picture at the left. Within the circle the girl is spinning with a distaff.

Haverhill and Boston. Within a few blocks in Boston you can find the city offices of three hundred shoe factories. The factories are scattered through the neighboring region, and the shoes made in them are sold in stores in forty states.

Brass and hardware centers. The peddlers who carried hardware from the blacksmith shops of Connecticut really started a half dozen manufacturing cities. Waterbury makes clocks, and, along with its neighboring towns, hundreds of products of brass and other metals. If you go into a hardware store and ask the salesman where he gets this and that of his hundreds of articles, you will find that many of them come from Connecticut. Hartford boasts that it makes more hardware and more kinds of hardware than any other city in the world.

Cotton and woolen goods. The people who live in the valleys of the Merrimack River are busy making cloth. At Lawrence and Lowell in Massachusetts, and at Nashua and Manchester in New Hampshire, are high waterfalls which furnish enormous power. In these cities the factories are so huge that you are amazed at their size. The people here know little about working leather or metals, but they know all about making cotton and woolen yarn and cotton and woolen cloth.

In the towns of the valley of the Merrimack thousands of spinners stand before long spinning machines. Each machine is spinning hundreds of threads and winding each thread on a bobbin ready for weaving. Other thousands of workers, called *weavers,* are each watching a number of noisy looms that work quite by themselves. If one of the hundreds of threads on a machine breaks, the whole machine stops. Then the weaver quickly ties the broken thread and starts the machine to making cloth again. A single company at Manchester, New Hampshire, can turn out 300 miles of cotton cloth in a day.

Seacoast towns, led by New Bedford and Fall River, Massachusetts, were once busy with the whaling industry, because whale fishermen outfitted their ships there and brought their cargoes to these ports. But whaling has become a small business since the kerosene lamp, gaslight, and electric light have come. Also the whalers have killed whales faster than they could be born and grow big. Now the people of

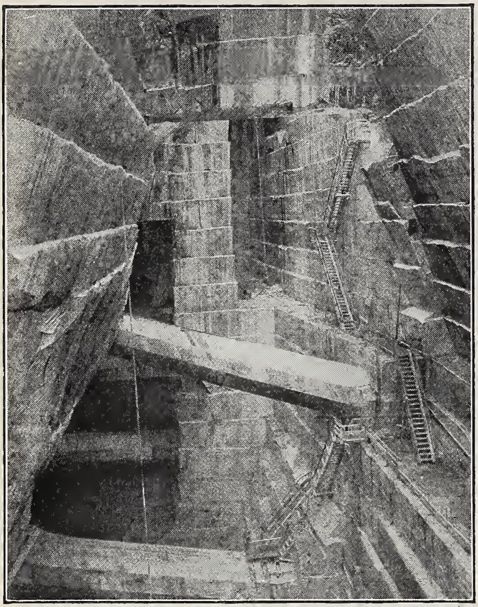


Fig. A. A marble quarry at West Rutland, Vermont. See the stairs leading down into the quarry.

these towns are busy in cotton mills, the machinery of which is driven by coal brought by sea from Philadelphia, New York, Baltimore, and Norfolk.

Another great cotton-manufacturing town is Pawtucket, Rhode Island. Water power from the Blackstone River helped this industry to get a start as did the boats which go up and down the river between Pawtucket and Providence and Fall River. The chief cotton-manufacturing towns of New England are New Bedford, Fall River, Pawtucket, Lawrence, and Lowell.

Some cities specialize in woolen rather than in cotton cloth. Lawrence and Providence are two leading cities that do this, and Danbury, Connecticut, makes Australian rabbits' fur into felt hats.

Many centers of manufacturing. There are many other special centers for manufacturing, such as Providence, Rhode Island, for jewelry; Holyoke, Massachusetts, for fine writing paper; and Augusta and Bangor, Maine, for articles of wood.

Much machinery is made in New England. Let the class discuss the reason why it is better for the maker and the user to have big, heavy machines made near the place where they are to be used. Worcester, Providence, and New Bedford are important centers for the textile industry, and use much machinery. They have become centers for the manufacture of textile machinery, which they ship out to other textile centers in the South and in the North Central States. Paterson, New Jersey, and Allentown, Pennsylvania, are silk-manufacturing centers and make the machinery that does the work.

Quarrying. Uses are found for some of the rocks of New England. Granite is quarried along the coasts of Massachusetts and Maine, in places where ships can come almost to the edge of the quarry to carry the heavy produce away. Near Rutland, Vermont, there are great marble quarries that send tombstones and building stones to many states.

New words and expressions. The leader says these words and points to a pupil. That pupil must say something true and interesting and use the word: retail merchants; established center; cobblers, shoe industry; outfitted their ships; spinning machines; bobbin; weavers; looms; moraines; quarries; textile industry; textile machine; textile center; whales; clocks.

A good example. The Merrimack is a good example of New England rivers. 1. Make a free-hand drawing of the river. Show the lakes it drains; put dots and initials for the cities along its banks. Show Boston near by.

2. Do the same for the Connecticut River.

Are you curious? 1. Look in the Appendix and count the number of New England cities and Middle Atlantic States cities having a population of more than 35,000.

2. Count the number of cities in the other groups of states which you have studied.

3. What does this prove about the work of the people in the New England States and the Middle Atlantic States?

Fig. A. Boston and its neighboring cities as seen from an airplane flying very high. See the many islands in the bay and the many lakes on the land. These are two signs of the visit of the great glacier.

SOME LARGE CITIES OF THE NORTHEASTERN STATES

Boston. What have we already learned about Boston (pages 388, 389, and 395)? Boston might be called the capital of New England. It is New England's largest city and chief port. It is also the headquarters for many companies whose owners live in Boston and have property in other places — such as paper mills in Maine, New Hampshire, and Vermont; textile mills in New Hampshire and North Carolina, and shoe factories all around Boston. A company has its head office in Boston, but it owns banana plantations in half a dozen countries on the Caribbean Sea, and also owns the steamers that carry the bananas to Boston, New York, and New Orleans.

Boston is proud of its beautiful public library, of its music, and of the many schools in and near the city to which thousands of students come each year. Harvard University, in Cambridge near Boston, like Yale University at New Haven, and many other New England colleges, draws students from many states and foreign countries.

New York City. One morning I got off a train in Jersey City. On the train were hundreds of men and women who lived in New Jersey suburbs of New York. They were going to work in the offices of Manhattan Island. As they left the train at Jersey City, dozens of men ran to catch an underground train that carried them under the Hudson River to the lower end of Manhattan Island. Subway trains ran every three minutes, but the people ran to get the first train. Nearly everyone in New York rushes about.

At five o'clock in the evening I went from the lower end of Manhattan Island to the northern borough of New York City, called the Bronx. To take the train, I went down steps from the sidewalk. Over the steps were the words *Subway Entrance.* Two flights down I came to the platform beside a railroad track. There were four tracks: one for express

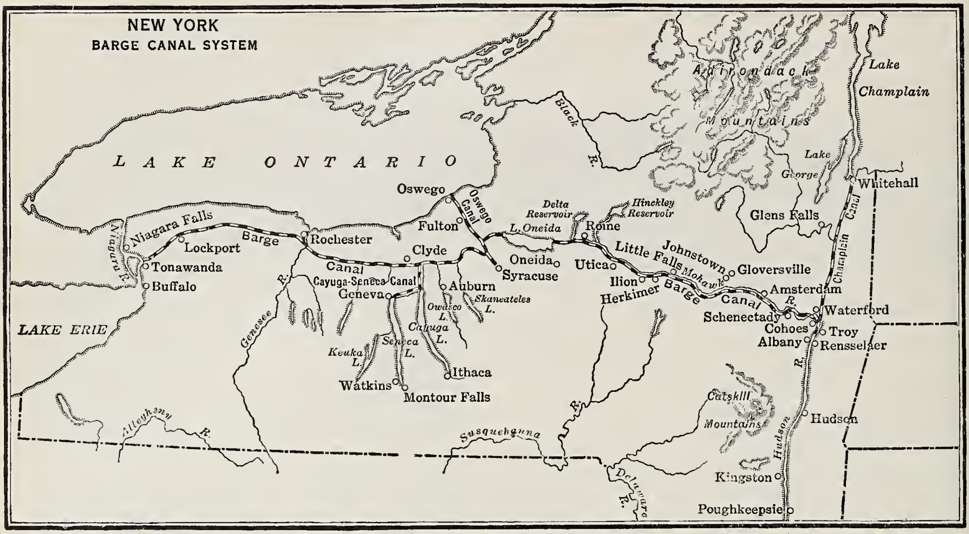


Fig. A. The New York State Barge Canal system. The Erie Canal, which crossed the state from the Hudson River to the Great Lakes, is now a part of the Barge Canal system.

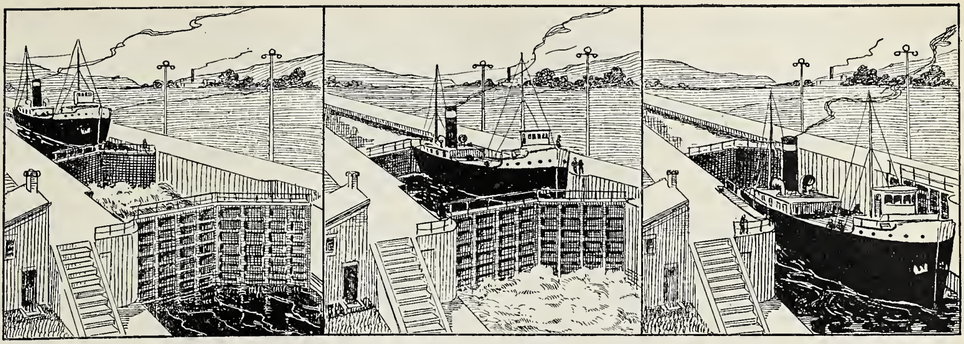
trains, and one for local trains going "uptown" (north); one for express trains, and one for local trains going "downtown" (south). I wanted to take the express train, but there were so many people on the express-train platform that I could not get near the train. I was still eight feet from it when it was filled.

On the arrival of the next train, a crowd of people rushed into all the cars and made the train so full that the guard on the platform took the last young man by the shoulder and pushed him in and held him in while closing the door behind him. The people were packed like sardines in a box, and most of them had to stand for nearly an hour. In this way, every morning many tens of thousands go from their homes in the northern part of the city, from Brooklyn, and from New Jersey, to work in the southern part of New York. Most of these people work in office buildings. Some of the buildings are twenty stories, thirty stories, and one is over one hundred stories high.

Why all this crowding into the lower end of one small island? What follows will help you to answer this question.

The Erie Canal and the crowding. How many passes less than 1000 feet in height can you find in the Appalachian highlands between Canada and Carolina? Figures 252-A and 386-A will help you to answer this question. The lowest of these passes is the Mohawk Valley (Fig. 386-A), through which the Erie Canal was built. On the completion of this canal in 1825 a banquet was held to celebrate the joining of the waters of the Great Lakes and the Atlantic, and people who made speeches said that New York would become a great city. Mules pulling boats along the Erie Canal at the rate of four miles an hour gave New York harbor the cheapest freight rates from the Great Lakes to the sea.

The Erie Canal served the Central States. The farmers on the new lands of the Central States were busy chopping, plowing, building homes, and growing crops. They shipped corn and wheat,



X Y Z

Fig. A. At *X* the boat is approaching a lock which is being filled with water. At *Y* the boat is in the lock, the gates are closed, and the boat is being lowered. At *Z* the boat is at the lower level and may now go on its way.

cattle and hogs, to the growing young lake ports of Cleveland, Toledo, Detroit, Chicago, Milwaukee, and Duluth. Because the new Erie Canal took goods cheaply to New York harbor, more railroads were needed to bring goods from the Central States to the lakes. Engineers laid tracks from the lake ports across the level prairies to Cincinnati, St. Louis, Kansas City, Omaha, Minneapolis, and St. Paul. The new railroads brought produce to the steamboats on the lakes. The lake steamers brought goods east to Buffalo. Because boats could not go from Lake Erie to Lake Ontario (Fig. 398-A), their cargoes were unloaded at Buffalo and put on canal boats to continue their journey by the Erie Canal to New York. In New York harbor much of the produce was transferred to steamships which carried it to Europe and other foreign countries.

The Erie Canal and the eastern cities. People on the farms in the new country of the North Central States, and later of the Western States, went to the stores near their homes and bought everything you can think of, from needles to axes, from canvas to thread, sugar, tea, boots, and pencils. Most of the things were made in factories of the Northeastern

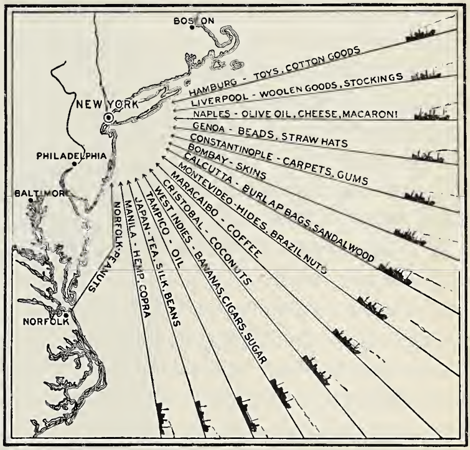


Fig. B. This map shows some of the steamships with their cargoes and ports from which they sailed, which entered New York harbor during one week in July.

States or imported through the ports of the Atlantic and Gulf coasts. Imagine a great stream of manufactured goods moving along this route from east to west, and another great stream of grain and meat moving from west to east along this route.

The ports in the Northeastern States received the most imports and shipped the most exports. Make a list of these port cities. New York, which leads them all, grew because goods could be shipped most cheaply by canal. Soon after the

Erie Canal was finished, men began to build railroads. There is now a four-track railway beside the canal from New York to Buffalo, and many other roads carry freight between the lakes and New York harbor.

The old Erie Canal that gave New York its lead has been rebuilt and enlarged and is now called the Barge Canal. The canal, which is closed by ice every winter, carries only about four million tons of freight a year, but it started the great trade route.

Work along a trade route. We may say that *a Trade Route Region* or *the Erie Canal Belt* is a good name for the Mohawk-Hudson waterway and the cities that have grown up along it. Imagine hundreds of thousands of men and boys working to keep this freight moving from one end of the Erie Canal Belt to the other, and to cities along the line. They are working with steamboats, ferryboats, canal boats, and barges; with locomotives, winches, and electric motors; with freight cars, express cars, motor trucks, hand trucks, horses and wagons; and also with pencils, pens, and paper, for there are many business records that must be kept. If you can think of the Erie Canal Belt as an avenue or artery along which, by night as well as by day, factory goods, raw materials, and food are passing every second, you will realize what a very busy place it is.

To store the exports and the imports, warehouses were built along the river fronts. Ships came to carry the goods to Europe and to other foreign lands. New York City grew. The ships that carried the exports brought back the imports, and New York became the great *import* port and the great *export* port.

A funnel map. 1. On a blank map of the United States, locate by dots and initials the cities of Cincinnati, St. Louis, Kansas City, Omaha, St. Paul, Minneapolis.

2. Draw red railroad lines from these cities to the cities of Chicago, Milwaukee, Duluth, Detroit, Cleveland, Toledo, Buffalo.

3. Draw blue lake-boat lines from all of these lake ports to Buffalo.

4. Draw a black line from Buffalo to Albany and on to New York and also to Boston. Does your map look like a funnel?

5. What products pour eastward through this funnel?

6. Through what one city do these products pass?

7. What happens to some of these products at the harbor of New York City? Why do more of them go to New York City than to Boston?

8. What products are scattered westward through the funnel?

Why? 1. Why might one say "Boston is the capital of New England"?

2. Why does the largest trade of the nation go through New York's port rather than through San Francisco's or New Orleans' or Baltimore's?

3. Why may New York's port be built even larger than it now is?

4. Why was the Buffalo-to-New York route the best canal route across the Appalachians?

5. Why is the port of New York in two states?

Where do the workers live? Looking at the maps, pages 386-387, make a list of the small cities or suburbs within twenty miles of New York City.

Making comparisons. 1. From the Appendix, find the largest and the second-largest city in the United States.

2. How many more people live in New York than in the second city?

3. How many people live in your city or township or county?

Employment agency. Make a list of the jobs that are to be found along the Erie Canal route. What kind of work must be done on a ship when it arrives in port?

Telling fortunes. 1. If you had lived before the building of the Erie Canal, could you have foretold the success of the canal?

2. What would you have told the people of New York about their future if the canal were built?

3. What would you have told the lake cities about their growth?

THE WORK PEOPLE DO IN NEW YORK

The work of the port. At first the city was only a little settlement at the southern tip of Manhattan Island. This was a convenient meeting place for ships from the sea and for boats coming from two other directions. Find this spot on Figure 187-A. Notice on a map of New York the long, narrow shape of Manhattan Island. Steamships enter from the Lower Bay and go through the Narrows into the Upper Bay. These steamships come from many distant places (Fig. 399-B). Find the names of the two rivers that flow into the Upper Bay. Miles of piers and wharves for ships, and warehouses to store goods line both rivers on both their banks. There is room for many ships. This is one of the reasons why New York became a great port. It would take you more than a week to walk along all the wharves where ships and vessels load and unload in New York harbor, but there are plans for another great harbor in Jamaica Bay. New harbors have already been dug in South Brooklyn and in the meadows of New Jersey near Newark.

Fig. A. The Empire State Building, New York City, has 102 stories. It is the tallest structure ever built by man. At the top is a mooring mast for airships.

One port in two states. The port of New York includes parts of the two states that touch the Hudson River near its mouth. Some days a half dozen large passenger steamers sail from New York for Europe, and an ocean-going steamer enters and leaves the port every twenty minutes on the average during the hours of daylight. All of these vessels have to be loaded and unloaded. They buy fuel for their boilers, oil for their engines, food for crew and passengers. Sometimes they are painted or repaired. Thousands live by the wages of ship work.

Every day hundreds of barges are at work in the harbor carrying freight from one ship to another, from ship to railroad, from ship to warehouse. Large ferryboats carry long trains of freight cars from the railroads on the west shore of the Hudson River to Manhattan, to Brooklyn, and sometimes carry the cars alongside ships to transfer the freight from cars to ocean steamer. Thousands of men are constantly employed in loading and unloading vessels, in putting the freight away in warehouses, and in taking it

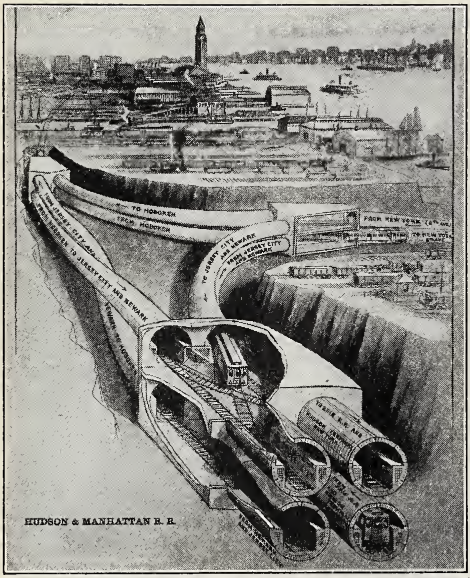


Fig. A. New York City is so crowded! Hundreds of thousands of people must get into and out of the city each day. Many of them ride in subway trains which run in tubes underground and under the river. In this picture you see the tube, as it leaves the river, branch out into many smaller tubes which go to near-by New Jersey cities.

out again. The street facing the wharves on the Hudson River is very wide. It looks almost like an open square, but sometimes it gets so jammed with trucks and automobiles that traffic cannot move for an hour. Steamers have even sailed for Europe leaving passengers in taxicabs stuck fast in the streets only a hundred feet from the entrance to the pier door.

New York, the center for wholesale stores. The trains and ships that carried things from the North Central States and the South were equally useful to carry things back to those places. Therefore no place in the country is so good as New York for wholesale stores, which sell things to the stores in smaller cities and towns.

One November day I went to New York, and at eleven o'clock in the morning tried to get a room in a hotel. "Sorry," said the clerk, "but we have not an empty room in the house." "What is the matter?" I asked the New York hotel man. "Nothing," he said, "except that this is the buying season." I was told this again and again, and finally I had to go to Newark to sleep that night.

At this time of the year there are tens of thousands of men and women in New York from Oklahoma, Florida, Michigan, indeed from every state in the Union, and Canada as well. There are dozens of expositions of goods where buyers may see samples and order what they need. There are clothing expositions, a machinery exposition; book, picture, and art expositions. Visitors to New York enjoy seeing plays and listening to music. In the theater district near Broadway and Forty-second Street you can reach dozens of theaters in ten minutes.

New York, the money center. After New York became the great export center and the great import center, it became the money center. If a little bank in a country town in Virginia or Oklahoma has money it does not need, it puts it on deposit in a bank in New York or Chicago, mostly in New York. If the banker in the small country bank wishes to buy some stocks or bonds for a depositor, he probably telegraphs to a broker in New York, who buys them on the New York Stock Exchange. In times when business is good, this keeps thousands and even tens of thousands of clerks at work.

The railroads that carry freight from Chicago to New Orleans and from Chicago to Seattle have offices in New York. Even a railroad that runs from Denver to Salt Lake City has an office in New York. The companies that manufacture steel in Gary, Indiana, and Birmingham, Alabama, have offices in New York. One day I wished to buy a half dozen shovels for my

farm in Virginia. I sent the order to a little town in Pennsylvania where the factory is located. The answer came from the sales agency in New York. A company owning sugar plantations in Cuba has a whole floor in a New York office building. Because New York has become the money center, people there control the business in many distant places. This gives jobs to tens of thousands in the *great metropolis*.

New York, the factory center. The lines of boats and railways that have made New York a good place for import and export, for wholesale trade and finance, have also made it a place where a factory may get the raw materials it needs. No other port in the United States has ships that go so nearly everywhere and bring to one spot everything that the world produces. A factory can also sell its goods to wholesale stores in New York. Indeed, New York has grown so big that the millions of people who live there are themselves a great market. To supply the needs of the people of New York alone would require many factories making bread, shoes, furniture, or almost anything that you can name. Making clothes is the greatest manufacturing industry in New York. In some parts of Manhattan you can often see people walking along the streets carrying piles of half-finished clothes from one workroom to another. On the fifth or tenth or fifteenth floor of a building in lower Manhattan there may be dozens of people cutting out clothing and sewing on electric sewing machines. If the wholesale clothing merchant wants something in a hurry, he can send around the corner to the clothing manufacturer and have the goods made up in a day or two. It is almost as though the wholesale clothing house had its own factory, as indeed many do.

The city grows. Ships reach Manhattan easily, but an island is not a very good place for a great city because there is not enough land. Ways had to be found to carry people from home to work. Street cars soon began to carry people from the business part of the city to their homes uptown. Then someone invented an elevator by which people could be quickly taken from the first floor of a building to the top—five, ten, fifteen, or more stories—and down again. These tall buildings made much more room for people to work in the lower part of Manhattan Island. Every business man likes to be able to find quickly hundreds of businesses and tens of thousands of people, some of whom he might want to see. After elevators and steel framework made tall buildings possible, the streets of New York soon became very, very crowded indeed. Next, elevated railroads, really long bridges built on pillars high up above the street, helped to carry the people. Next, ferries carried people from New York to Brooklyn and Jersey City. Later a bridge was built to Brooklyn. Many people wanted to live uptown beyond where the elevated railroads could carry them, so subways — really tunnels — were built under the streets. There are now many streets with electric cars on the surface, elevated cars above, and subway trains below, and still there are not enough seats for all the people.

After a time subways were put under the rivers, and people were carried from Manhattan to Brooklyn, to Jersey City, to the Bronx. Because of all this crowding, very few of the people of New York live in a house and have a yard. They live in apartments, a few rooms which may be on the third, fifth, or tenth floor. Tens of thousands of New York boys and girls never saw a garden or a cow, or played

on a plot of grass in their lives. They live upstairs and play on the pavement of streets and on paved school yards.

The daily journey from suburbs to offices. While the morning rush of subway, elevated, and surface cars carries hundreds of thousands from outer New York to Manhattan Island, hundreds of suburban trains are carrying other New York workers to the offices of lower New York from their homes in northern New Jersey, Long Island, southeastern Connecticut, and New York State on both sides of the Hudson.

Making comparison. From the Appendix, find the largest and the second largest city in the United States.

Natural advantages. 1. Make a list of all the things which Nature has done to make New York City the second largest city in the world.

2. Explain how the Mohawk Valley gave New York City an advantage over Boston or Philadelphia.

3. Would you rather live in the city or in the country? Why?

Visit New York. Pretend that we are all strangers visiting in New York City. We visit a wholesale store. Choose someone in the class to show us through the store. We carry on a conversation with our guide and ask him some of the questions listed on this page. Perhaps you can think of more questions or more people of whom the questions could be asked. If our guide can answer all of our questions, then he earns his salary. Repeat this make-believe visit for a factory worker, a stenographer in an office building, a caretaker of an apartment building.

Questions for our guide through the wholesale store:

a. What do you mean by wholesale stores?
b. What do you mean by retail stores?
c. What goods do you sell in your store?
d. Where can we see your stock of sample clothing (or sample machines, or books)?
e. From whom do you buy your goods?
f. To whom will you sell your goods?
g. What are your busiest seasons?
h. When we leave your store, where can we go to amuse ourselves?

Questions to ask the factory worker:

a. What do you make in your factory?
b. Where do you get your raw materials?
c. Do the railroads help you in your business?
d. Do the steamships help you?
e. Do the wholesale stores help you?
f. Who works in your factory?
g. Who uses the things you make?
h. How are your machines run?

Questions to ask the office workers:

a. Where do you live?
b. How do you get to work?
c. Do you cross a river?
d. Do all people come to work in the same way?
e. Why are there so many kinds of transportation?
f. Why do you need elevators in this building?
g. Why are the buildings so high?
h. Of what materials are the buildings made?

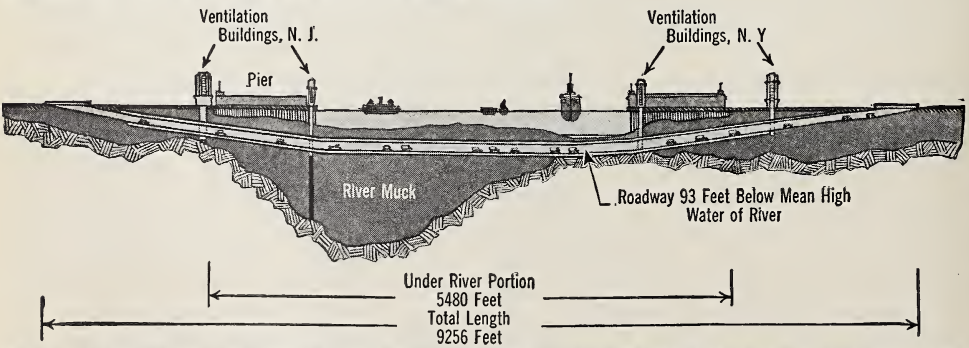


Fig. A. The tunnel for automobiles and other vehicles which connects Manhattan Island and Jersey City. The tunnel, as you see, runs under the bed of the river.

Fig. A. Water front at Buffalo as seen from the air. The Buffalo River which you see in the picture has been dredged and forms an inner harbor for boats from the lakes.

BUFFALO AND OTHER CITIES ON THE GREAT ROUTE

Buffalo, the funnel of the lower lakes. Buffalo is New York's partner because it is situated at the western end of the Erie Canal Belt.

Buffalo began as a landing place for the small lake boats that took shelter behind a little island just off the shore. But this little space between the island and the mainland was soon too small to shelter all of the ships that came there, and a long wall was built out into the lake, thus making an artificial harbor. The city more than doubled its population in five years after the canal was opened. Now each year two hundred to three hundred million bushels of grain, more than half of it from Canada, are brought here in lake boats and whisked up into tall grain elevators (Fig. 405-A) and allowed to run down into canal barges and freight cars bound for New York or some inland towns. Make a free-hand drawing to show this. Coal-dumping machines grab cars of anthracite coal from Pennsylvania and tip the coal into lake boats for shipment to the upper lake ports. For many years the lumber from the upper lake forests has been piled up on the docks at Buffalo, making it a great lumber center. Now that the lake forests are declining, the supply is coming more and more by rail from the South and West. Altogether, about 20,000,000 tons of freight are unloaded at Buffalo each year.

Power and the location of Buffalo. You can easily see that Buffalo must be a good place for manufacturing, because it is near Niagara Falls, the most perfect place in the world for men to build water-power plants. The Great Lakes are great storage reservoirs which make the river flow more evenly than any other large river in the world. Watch any stream after a rain and see how it swells and flows unevenly.

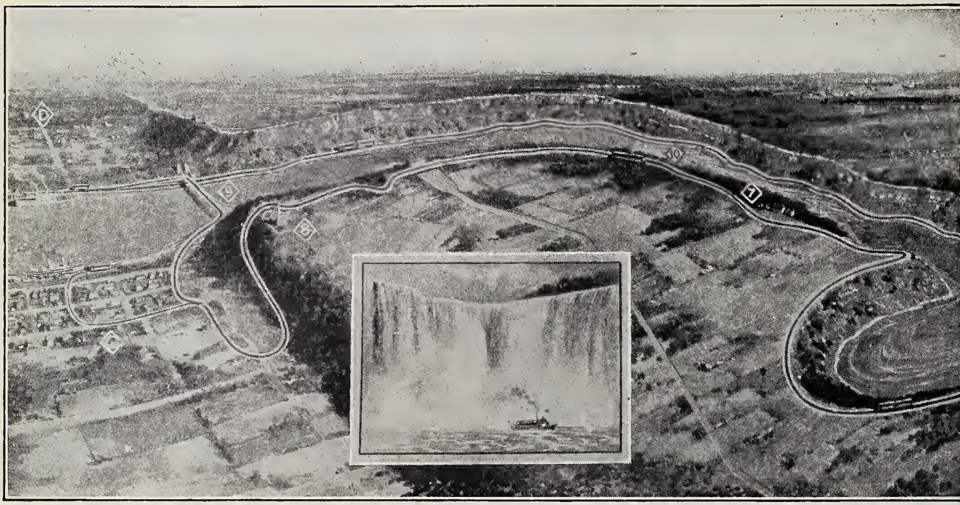


Fig. A. Niagara Falls, Niagara Gorge, and Whirlpool Rapids. *A* is the city of Niagara Falls, New York; *B*, *1* is the terminal of the rail route through the gorge; *2*, the Falls View Bridge; *3*, Queen Victoria Park; *4*, Table Queenston Heights; *9*, Queenston-Lewiston Bridge; *10*, Lower Rapids;

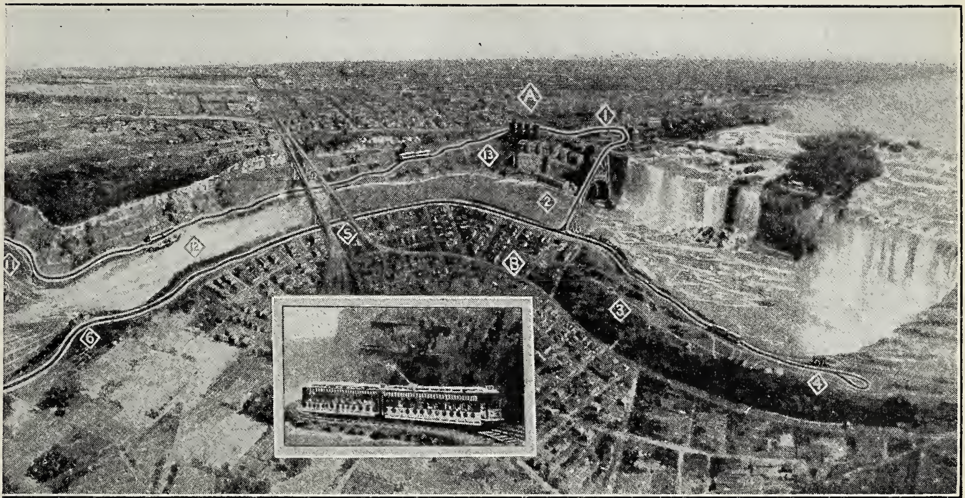
The Niagara River never doubles its flow. The deep gorge of the falls (Fig. 406-A) gives the engineer a chance to have water fall two hundred feet. The engineer knows how to use the force of this falling water to make electricity.

Electric power, equal to that of hundreds of thousands of horses working at their best, night and day, goes over wires from Niagara Falls to places far away. Thus, Buffalo has lake-borne wheat, power from Niagara, and is located beside the canal route to New York. Could there be a better place for making flour? Buffalo rivals Minneapolis for first place in flour milling. Kansas City, Kansas, is third. The lumber market has helped Buffalo to become the site of a score of furniture factories.

The heavy freight of Buffalo. The many factories of Buffalo make heavier products than the industries of New York City. The ease of moving freight by lake boats is one reason for this. Other reasons are the supplies of coal, iron ore, and lumber which are handled in Buffalo. These facts help to explain why Buffalo turns out a greater value of manufactures a person than any other large city in the United States.

Some years ago a great steel company chose Buffalo as the best place to build a new plant from which to supply the eastern market. Buffalo was chosen because almost the same conditions we found at Gary (page 376) were also at Buffalo. First the steel company made an artificial harbor. Then they ran the ore boats from the lake to one side of their furnaces and the freight cars from the Pennsylvania coal fields to the other side of the furnaces. The lake, the canal, and many railroads take the heavy product of this mill to market.

Cities between New York and Buffalo. You can easily see that the cities between New York and Buffalo have good transportation. You can also see that they are cities *through which* freight passes, rather than cities for *loading and unloading freight*, as are New York and Buffalo. The boats and trains make the cities fine places



the city of Niagara Falls, Ontario; *C*, the city of Queenston, Ontario; and *D*, the village of Lewiston, New York. Rock; *5*, railroad bridge; *6*, aero car over the Whirlpool; *7*, Niagara Glen; *8*, General Brock monument on *11*, Whirlpool; *12*, Whirlpool Rapids; and *13*, a water-power plant.

for manufacturing. It is easy for any city to get anything that comes to New York or Buffalo. This fact has helped to make a string of cities grow up along the great route; the counties that touch it have five sixths of the population of New York State. How many cities above 25,000 population are on or near the waterway of the Hudson and the Barge Canal and the railroads that follow their banks between New York and Buffalo? Find the answer in the Appendix and put the largest cities on your map.

Troy. Years ago, a minister's wife in Troy made a collar that was not attached to a shirt. This had never before been done. Since people liked such collars, the clever woman got her neighbors to make them for her, and she sold them. From this beginning has grown the greatest collar, cuff, and shirt industry in the United States.

Albany. Albany, the capital of New York State, is a water-route center, because the canal from Lake Champlain here joins the Hudson and the Barge Canal. Tell why you think it is a railway center also. Albany may be starting on a period of great growth because the river was deepened in 1931. Ships needing twenty-seven feet of water can now go to Albany. Eighty-five per cent of the world's ocean vessels can now reach that city if they need to.

Schenectady. This city on the Mohawk River specializes in electrical machinery, as Troy specializes in collars and cuffs. Here are a locomotive works and the large plants of the General Electric Company, which employ over 90 per cent of the workers of Schenectady. They make hundreds of kinds of electrical appliances, from a tiny instrument to a huge dynamo so powerful that it can make and send out on wires ten thousand horse power of electric current as it whirls around.

Syracuse. Syracuse is unlike Schenectady because it has a *great variety of industries*. Among them are many kinds of machinery and a remarkable industry that manufactures soda ash, a chemical very important in manufacturing plants

Fig. A. A part of the city of Schenectady and the main plant of the General Electric Company as seen from the air.

and in drug stores. It is made of salt and coal. Rock salt is found near the city far down under the ground. It is mined by the simple method of pouring fresh water down into the ground in one pipe and letting the water dissolve the salt. Then it is pumped up through another pipe and on through a pipe to the factory where it helps to make soda ash.

Rochester. Rochester is a little like Buffalo in having the benefit of a waterfall close by. A long cliff runs for many miles east and west across northern New York. In one place the Niagara River falls over the cliff, making Niagara Falls. At another place the Genesee River falls over the cliff, making Genesee Falls, close to Rochester. Therefore Rochester was making flour and sawing lumber by means of water power a hundred years ago. Then the Erie Canal came through Rochester, giving an outlet to New York. This city now turns out great quantities of scientific instruments, optical goods, and films. It leads the world in the manufacture of cameras. Rochester also has a fine school of music.

Whys and wherefores. 1. What foreign country sends wheat to Buffalo?

2. Name three kinds of freight handled at Buffalo.

3. What three kinds of factories do especially well in Buffalo?

4. Why must freight be unloaded at Buffalo?

5. Why does much freight pass through the Mohawk Valley?

6. What large universities are in New York City?

7. How is salt mined in Syracuse?

8. Why is Niagara power steady all year?

9. Where does Rochester get power for factories?

10. What three routes meet at Albany?

A question in arithmetic. Niagara Falls has 7,000,000 horse power. This is equal to the work which 21,000,000 horses could do. If it takes 5 acres of land to feed a horse, how many acres of land is Niagara Falls worth? How many square miles?

Extra work for interested people. Find more about Niagara Falls by reading in other geographies, or in an encyclopedia.

Fig. A. The coal which we are now using was made from plants like those in this picture. The plants fell down into the water and were covered with mud. The mud hardened into stone. The plants changed into coal.

COAL AND CITIES IT HELPS

How coal is made. Long ago, long before the glaciers came, millions of years before the glaciers came, the place where the Appalachian plateau now stands was low, level ground, and the climate was rainy. As most of the land was level, the heavy rain made it into great swamps. Many plants grew in these swamps. Some of the plants were trees; some were ferns; many were only moss. The moss grew and died and grew again, and the trees dropped their leaves, their bark, their seeds, and finally their trunks into the water of the bog. The water and the acids in the water of the bog kept all this material from rotting. Year by year the bog was built up higher and higher, and became a kind of brownish mass which we call *peat.*

You can find peat bogs in many parts of the world today. There are many in the great northern forests of Canada, where they are called *muskegs.* There are some in New England and in all the countries of northwestern Europe. If you take peat out and dry it, it will burn. Millions of people in Europe do their cooking and heat their houses with dried peat which they gather each summer from the bogs. Some of these bogs might become coal some day, for all the coal in the world was made by peat bogs that were covered up with sand, mud, and sea shells. Often the sand, mud, and shells lay there so long that they turned into sandstone, shale rock, and limestone. It has taken a very long time to make coal. If the layers of rocks and the layers of coal lie flat like the pages of a book, the coal is soft and is called *bituminous.* If the rocks have been bent and twisted, the coal is usually hard. Hard coal is called *anthracite,* and the mining of anthracite is a great industry in northeastern Pennsylvania. About 70,000,000 tons of anthracite a year are mined in the eastern part of the state, and 122,000,000 tons of bituminous coal in the western part of the state. Indeed, we might say that coal has made

Fig. A. Independence Hall in the city of Philadelphia. This building, in which the Declaration of Independence was signed, is considered to be one of the most beautiful examples of colonial architecture in this country.

the cities of Scranton, Wilkes-Barre, Pittston, Shamokin, and many smaller towns on or near the 500 square miles of land that have anthracite under them.

The anthracite-coal region. People who talk of railroads speak of the "anthracite roads," meaning six railroads that would be almost or completely ruined if they should lose their trade in carrying anthracite coal. The anthracite roads carry coal directly from Scranton, Wilkes-Barre, Pittston, Shamokin, and other mining cities to several hundred cities. Millions of tons are shipped by water from the coal piers at Buffalo, Philadelphia, and Bayonne, one of the group of New Jersey cities on New York harbor. A common sight on the Delaware River is a sea-going tug with her long steel cable stretching back to a barge to which three other barges are tied in single file. Thus is coal carried in big floating boxes. You will see many of these sea-going *coal trains* on their way to the ports of New England. Unfortunately, the six New England states do not have even one good coal mine among them.

The hundreds of thousands of people who work and live in the anthracite field buy things from everywhere with wages they earn in the coal mines, or with wages from silk mills. There are many silk mills in which the women work while the men are underground in the coal mines, or at work in the coal breakers. A coal breaker is a large building where coal is made ready for market by being broken, sorted into different sizes, and by having the stone picked out of it.

The people in the anthracite region have talked much of hard times of late because cheap oil from the South Central States and from South America and Mexico is being used in so many house furnaces that less anthracite is used. There is not so much work for the coal miners as there was before oil was used as a fuel for furnaces.

Coal and manufacturing. Hard coal has been mined in eastern Pennsylvania for more than a hundred years. Mining hard coal began before the railroads came. Then coal gave the canal builders great hope and much work. They built a canal from the coal fields down the Lehigh River, a branch of the Delaware, down the east side of the Delaware River to Trenton and across New Jersey to New York Bay. Another canal on the west side of the Delaware River carried coal to Philadelphia. There was still another canal down the Schuylkill River to Phila-

delphia. Eastern Pennsylvania, therefore, and especially Philadelphia, has had a splendid fuel supply during nearly all the time that men have been using machines and factories.

Philadelphia. The *Quaker City* started its manufacturing with power from the waterfalls of the Schuylkill. Then came coal to drive her engines; then coal made iron to make machines; and today the city is a great center for machinery. The first locomotives in America were built in Philadelphia. The city is still headquarters of the greatest locomotive manufacturing company in the world, but their plant has outgrown its city location and locomotives are now made in a great new plant ten miles down the Delaware River, near Chester. Chester has nearly 100,000 people, and it might be called a suburb of Philadelphia, with industries much like those of the greater city.

The farmers on the rich lands near Philadelphia have always given that city a good food supply. East of Philadelphia is the coastal plain with its sandy soil good for fruit and vegetables, and so near that the farmers' wagons have hauled their crop to the city markets since the founding of the city. On the west side of the city is the Piedmont, equally near, whose rich clay soil gives grain for bread, and pastures and hay crops for the cows of the dairy farms. Philadelphia was important enough at the time of the Revolutionary War to be the place where the Continental Congress met to talk about becoming independent of Great Britain. At this time, Philadelphia had a beautiful old building which we now call Independence Hall. Thousands of people visit it every year because the Declaration of Independence was signed there in 1776.

Philadelphia was also the capital of our country for a time. Now it is a great center of manufacture, having, in addition to its great variety of machinery, large factories making hardware, woolen goods, carpets, leather, chemicals, and many other things. The city calls itself "The Workshop of the World" because it has so many different industries.

Bethlehem. Bethlehem is halfway between Philadelphia and the anthracite coal fields. Like Schenectady, it is a city with one industry — iron, steel, and articles made from them. The great steel plant at Bethlehem uses coal from the near-by anthracite fields. The iron ore is carried long distances. Much of it comes by way of Buffalo from Lake Superior. Some of it is unloaded at the docks of Philadelphia

Fig. A. The Delaware River Bridge which connects Philadelphia and Camden.

from ships that brought it from Chile, hundreds of miles beyond the equator in western South America.

Bethlehem is in the Great Appalachian Valley (page 291), which extends from New York to Alabama, and everywhere has limestone and shale. These two kinds of rocks make cement when they are burned in a hot fire. Cement mills are scattered along the Appalachian Valley from Birmingham, Alabama, to Phillipsburg, New Jersey, but Allentown, Northampton, and other towns near Bethlehem form the greatest cement-making center in the United States.

Philadelphia's neighbors. The city of Camden, across the Delaware River from Philadelphia, is a part of the port and industrial district of Philadelphia, just as Jersey City, across the Hudson, is a part of the *metropolitan district* and *port* of New York. The industries of Camden are much like those of Philadelphia. It has a great plant where steel ships are built, and other plants where the produce of near-by farms is put into cans to be shipped to many places. It might be said that Camden sells much noise, because the phonographs and phonograph records made there are repeating words and music in almost every land and language. The city is frequently called "The Radio Center of the United States" because so many radios are manufactured there.

Trenton. Trenton happened to have a few potteries a hundred years ago which made earthenware vessels from the clay banks near by. The soft clay was molded into the required shape and fired; that is, heated until it was glazed or baked hard with fires of cordwood from the near-by forests. The anthracite coal was a great help to this industry. Later, ships returning to New York and Philadelphia began to bring fine potter's clay from Europe and Florida very cheaply, and now Trenton uses much imported clay in addition to her own, and has dozens of pottery companies making porcelain and china. She probably makes every article of this kind of material you could name, and many more which you never thought of or heard of. Pottery from Trenton is used in every state in our country, and some is exported.

A coal map. 1. Using a blank map of the United States, fill in the coal regions. Draw a line from Chicago to Norfolk to set off the region.

2. List in the margin of the map the names of the states in which coal is found.

3. Place red dots for the cities of Pittsburgh, Scranton, and Wilkes-Barre, which are big railroad centers for coal shipment. Place blue dots at Buffalo, Philadelphia, and Bayonne, which are big seaports for coal shipment.

4. Blacken the Ohio and the Mississippi rivers, down which coal barges go to the sea.

5. In the lower corner of your map, tell what your colored dots and lines stand for.

6. Put in one corner of the paper two graphs: one showing the amounts of coal mined in leading states, and the other the amounts of coal reserves in leading states.

7. Draw a colored line from Birmingham, Alabama, through Knoxville, Roanoke, Staunton, Hagerstown, Chambersburg, Harrisburg, and Lebanon to Bethlehem. This line stands for shale. Draw beside it another colored line. This stands for limestone. What do the lines on your map tell you about cement?

Your museum. Bring to school samples of different kinds of coal, and samples of sandstone, limestone, and shale.

Coal. 1. Write your own story of coal, using these words: bogs, sandstone, peat, shale rock, tug, limestone, bituminous, anthracite, anthracite roads, anthracite region, coal breakers, coal fields, freight boats, Scranton, Bayonne, Philadelphia. Underline these words in your story, to be sure you used them all.

2. Tell or write the story of coal and Philadelphia.

3. Of coal and cement.

4. Of coal and Bethlehem.

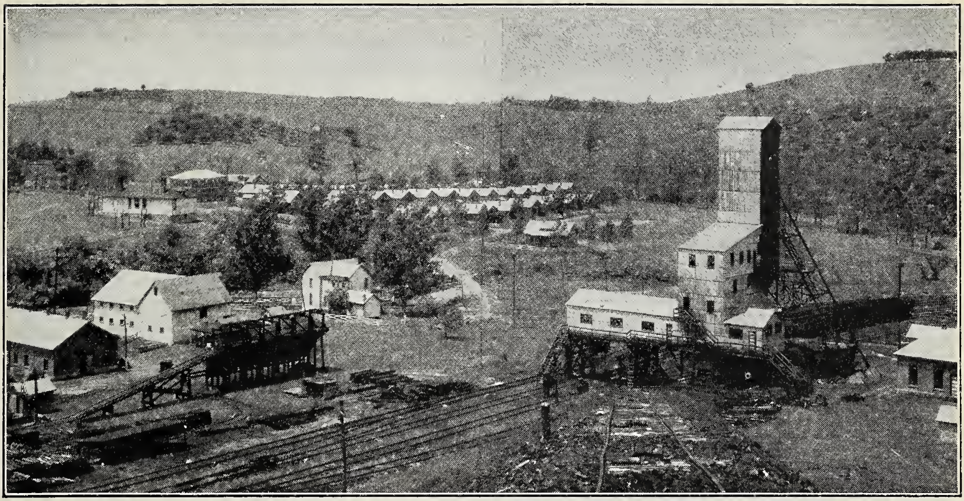


Fig. A. Bituminous coal mine buildings in the Appalachian plateau country of western Pennsylvania. West Virginia has many such mines. The large building is called a *tipple*. The shaft of the mine comes to the surface inside the tipple. See the houses and school built by the coal company for its employees.

COAL AND IRON IN WESTERN PENNSYLVANIA

Iron. Pennsylvania has been the leading iron-making state for a long time.

No one knows how long ago men learned to roast iron ore in a hot fire until it was melted and the iron ran out, ready to be pounded on the anvil as we see the blacksmith pounding and shaping iron today. Long before the time of Christ, white men, yellow men, and black men were making iron — good iron, too — in many parts of the world. Iron spearheads and axes were a great improvement over the tools of stone that men had used before they got iron. Learning how to make iron was the greatest work of ancient man, after he had tamed the farm animals. These early people made a fire of charcoal (partly burned wood) on a little hearth or forge, and fanned the flame to make it very hot. In this fire they melted iron ore.

Men were still making iron with these charcoal fires when our great-grandfathers were born. There were stone forges, or furnaces, for making iron, in the woods in every state on the Atlantic coast. Some of them may still be seen partly tumbled down and overgrown with bushes, vines, and trees. Most of the forges, however, were in Pennsylvania and New Jersey, where iron was plentiful. Soon after the railroads came (about 1830), someone learned how to make iron with the hard coal found in eastern Pennsylvania near the cities of Scranton and Wilkes-Barre.

After a few years someone discovered a way to burn partly the soft coal of western Pennsylvania, and turn it into *coke* to be used instead of charcoal or anthracite for smelting iron ore. There is so much more soft coal than hard coal, and soft coal is so much easier to dig, that many of the iron makers moved over to western Pennsylvania. Here the flat layers of soft coal stick out of the rocks on the hillsides, and county after county has layers of coal under its surface. That region now has hundreds of coal mines where men are

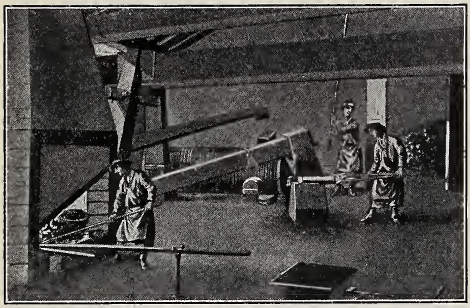


Fig. A. An old forge near Philadelphia, showing the old-fashioned way of hammering iron into bars.

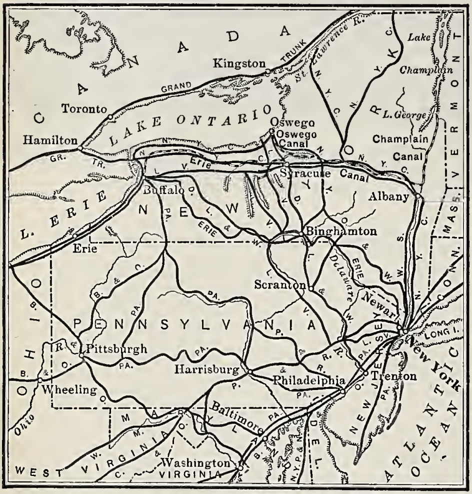


Fig. B. Some of the railroads of the Middle Atlantic States. See how the railroads enter Pittsburgh like spokes of a wheel.

digging out soft coal, and scores of towns where the coal mine is the only industry.

The way we now make iron. An iron furnace of today is ten times as high as a room in an ordinary dwelling house, and is full of roaring fire from top to bottom. Its flames light up the sky at night for miles around. We get melted iron when iron ore is put with limestone in a hot coke fire. These three things are dumped into the furnace every few hours, day and night, weekdays and Sundays, for months and months. The fire in the furnaces is never allowed to go out, except for repairs.

Every few hours a hole is opened in the bottom of the furnace and the melted iron runs out. This is led down a channel in a sand floor and allowed to run off into little pools that have been molded in the sand. Here the hot metal cools in chunks, being about as big as three or four bricks. These pieces are called *pigs*. Sometimes the liquid iron, without ever getting cold, is taken to the neighboring steel mills, where it is heated more and changed into steel. This is poured into big molds and cooled a little. Then, while still white-hot, it is rolled by big rollers into bars, rods, rails for railroads and trolley lines, plates for boilers and ships, parts for steel bridges and steel buildings, and sheets for tin plate.

Pittsburgh, a natural meeting place. Pittsburgh is in a deep valley. It is, indeed, in three deep valleys: the valley of the Monongahela River and the valley of the Allegheny River at the place where these valleys meet the Ohio River Valley (Fig. 386-A). How many railroads enter Pittsburgh according to Figure 414-B?

Railroads cannot run up and down steep hills. Therefore, in hilly country, they almost always follow streams. If men tried to build a railroad in a circle a few miles from Pittsburgh, it might cost nearly a million dollars a mile because it would have to be either in great tunnels under the hills or in long, high bridges over the valleys, or perhaps both.

The valleys in the plateau made Pittsburgh a natural meeting place for western Pennsylvania. The city naturally grew up at the place where the roads carrying coal and everything else came together.

Pittsburgh coal. The whole plateau around Pittsburgh is underlaid with coal. There are coal and mining towns in all

directions. There are scores of villages and towns in the hills and forests of southwestern Pennsylvania where the only industry is coal. Here the men come home grimy from the day's work. In the morning the miner and his neighbors ride into a hole in the hillside. All day they work in the dark, beneath a rock roof of hard shale, and lighted by the little lamps on their caps. The men fill the cars with coal, and the little electric locomotive pulls out the cars.

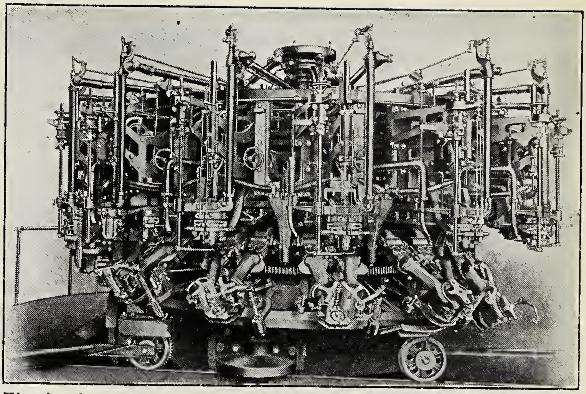


Fig. A. In making bottles the glass blower has been replaced by this machine which receives a vat of molten glass, hands out hundreds of bottles each hour, and works night and day without ceasing.

Pittsburgh, the iron capital of the world. There is iron ore near Pittsburgh. This was smelted in the early days of the city and much iron was produced. About 1884, however, the lake boats began to carry iron ore from near Lake Superior (page 373) to the lower lake ports for shipment by rail to Pittsburgh. Now millions of tons are brought every summer and piled up in the autumn to feed the furnaces in the winter season, when lake harbors are closed by ice.

Pittsburgh is often called the *Smoky City* because the iron furnaces and the steel plants burn so much soft coal that sometimes the city is almost hidden by a cloud of smoke. Up and down the rivers in Pittsburgh and outside the city the valleys bristle with the tall black blast furnaces and the acres and acres of dusty roofs of steel mills. Here tens of thousands of men work in the heat and dust and roar of machinery, where pig iron and steel are made and rolled into rails, plates, beams, and hundreds of other articles of steel. Steel is the raw material for hundreds and thousands of articles, among them the automobiles of Detroit, the reapers of Chicago, the steam shovels of Milwaukee, the cash registers and the machine tools of the cities of Ohio.

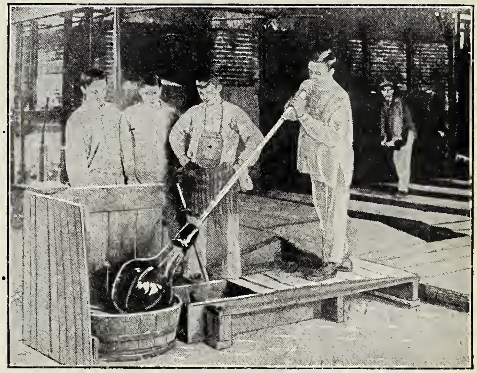


Fig. B. Blowing glass bottles, old style.

Glass. Pittsburgh is also an important center for the manufacture of glass. Glass is melted sand. The mountains near Pittsburgh have quarries of the special kind of fine, pure sand from which glass is made. It is easy to melt the sand there because of the cheap coal and the natural gas which comes in by pipes from the oil fields of West Virginia (Fig. 290-A).

A free-hand map. Figure 386-A will help you to draw your map. Let your map show the Allegheny, Monongahela, and Ohio rivers. Shade the mountains and plateaus. Show the railroads bringing iron from the lakes; taking iron and coal to Philadelphia, to Columbus, Ohio, to Cincinnati, Ohio, to Cleveland, Ohio, and to Washington, D. C.

Fig. A. This New England field is fenced with stone from its own surface.

The longest list wins. See who can make the longest list of things that use iron for raw material.

Tell. Tell something about Pittsburgh and valleys; Pittsburgh and the plateau; Pittsburgh and coal; Pittsburgh and iron; Pittsburgh and glass.

Explain why Pittsburgh and Buffalo make heavy articles of iron and steel, while New England makes many small, light, valuable articles of iron and steel.

Use these correctly. Underline them as you use them: iron ore; anvil; charcoal; hearth or forge; blast furnaces; coke; limestone; smelt; pigs; molds; steel mills; boiler plate; beam; steel buildings.

Coal versus Iron. Pretend that *Coal* and *Iron* had a debate as to which of the two is the more valuable to *Man.* Defend either the side of *Coal* or of *Iron.*

FARMING IN THE NORTHEASTERN STATES

What the level West did to the hilly East. As we have seen before, the settlement of the Central and Western States gave jobs (free farms) to the sons of farmers in the Northeastern States. We might also say that agriculture in the Central and Western States almost killed agriculture in parts of the Northeastern States. Machines have taken farming from small farms and little fields to big farms and big fields. The farmer on the rich, smooth, level, easily worked lands, about which you have already studied, can produce grain and meat and hay much more cheaply than can his cousin who stayed on the more hilly, rocky lands of New England, or on some of the farm area of New York, Pennsylvania, and northern New Jersey.

Before machinery and railroads came, the little hill farm could grow enough corn and wheat and meat to feed its own people, enough wool to make their clothes, enough wood to heat their houses. The farm horses pulled the plow, pulled the family wagon to the near-by mill, and the family carriage, if there was one, to the near-by church and store. When the railroads and lake steamers began to bring western farm produce to the eastern cities, the prices went down and the farm business in the Northeastern States became bad. Many young people went to seek jobs elsewhere. When the old folks died or went to town to live with their children, no one was left on the farm. Many farms were abandoned. Weeds, bushes, and trees grew up in the fields; the roofs of the house and barn began to leak; the buildings slowly rotted. This happened to thousands of farms between 1880 and 1915. Then came the automobile, and it caused still more farms to be abandoned. The farmer needed a car and gasoline and oil and tires. The little farm that had provided a good living for his father, his grandfather, and

his great-grandfather could not earn enough to take care of him and his automobile. Therefore New England farms have been abandoned by the hundreds, and the same thing has happened in some sections of New York and Pennsylvania and many other states. Some New England townships that had fifty or a hundred children in school in 1860 have today not a single occupied house. The people went to the farms of the West or the factories of the near-by town. Some of the old farms have been bought by city people for summer homes. Lumber and paper companies have bought abandoned farms and planted trees on the land.

In most places where farming has continued, some special crop is grown that cannot be shipped in from Illinois, Iowa, Florida, or California.

The dairy industry. The cities of the Northeastern States need millions of quarts of fresh milk and cream every day. Butter and cheese can come from Wisconsin, Minnesota, or Dakota, but the milk must come from the near-by farm because milk can be kept fresh only a short time. Therefore dairying is by far the greatest agricultural industry of the New England and Middle Atlantic States. In summer, cows can find the grass they need, even in rocky pastures. Hay is the one crop that can keep on growing on a farm, and can be harvested for many years after the farm has been abandoned as the home of a family. More than half the harvested crop land of New England is in hay fields. Caring for cows is the winter job of the farmer (page 369).

The silo and canned corn. The French invented the silo in the last part of the last century. The silo has been a great aid to the New England dairy farm. Corn for the silo is cut while the stalk is still

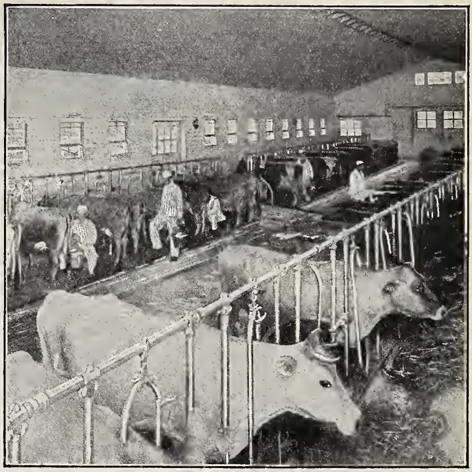


Fig. A. Milkers at work in a dairy barn for city supply. If you call a cow a factory, what raw material does she use? What products does she produce?

green and the grain is still moist and far from ripe. Corn can often be put into the silo a month or more before it could be cut for storage in the crib or shipped to market as dried corn.

In southern Maine the farmers grow sugar corn. They take ears of corn to the canning factory while the grains are in the soft or milk stage. The corn is cut from the cob and put into tin cans. You have often eaten corn which you buy from your grocer and which he may have bought from the New England States. The husks and stalks of corn that remain are chopped fine and go to the silo to feed cows in the winter season. You eat the tender grains of corn, and the farmer's cows get the husks and stalks, and all are contented.

Dairying in New York and Pennsylvania. As the cities of the Erie Canal Belt have grown, the farmers of the uplands (Fig. 386-A) to the south and north of this string of cities have ceased to grow grain for market, and have turned more and more to the dairy cow as the chief farm

Fig. A. A nursery for young trees on Long Island. This winter scene gives an excellent idea of the general flatness of much of Long Island and the rest of the Atlantic Coastal Plain.

business. Many of them buy grain from the Central States to feed their cows.

The Allegheny plateau in northern Pennsylvania and southern New York is not so high nor so steep nor rocky as is most of the plateau farther south. Much of it is rounded hills good for grass. Scores of milk trains run every day on the railroads and take the produce of this land to Rochester and Syracuse, but especially to New York, Philadelphia, Buffalo, and Pittsburgh.

The passing of cheese and butter. Years ago the farmers of many neighborhoods in New York State took their milk to cheese factories or to creameries. Now many cheese factories and creameries are abandoned because the farmers are shipping fresh milk to city markets. Cheese and butter come in by carloads from more distant places (page 368).

The Great Appalachian Valley and the Northern Piedmont. The only part of the Northeastern States with an agriculture that is like that of the Central States is the Great Appalachian Valley of which we read on page 291. This valley extends with its rich limestone soils across southern Pennsylvania and into New Jersey. The Appalachian Valley and the near-by fertile sections of the Piedmont are still growing the Corn Belt crops of wheat, corn, and hay, but the farmers nearly always turn all of this produce, except the wheat, into milk or meat before sending it to market.

The Atlantic Coastal Plain. The New Jersey and Long Island section of the Atlantic Coastal Plain is almost exactly like the neighboring coastal plain section of Delaware, Maryland, and Virginia (page 266). Because it has the same soil and climate, it has the same crops — potatoes, tomatoes, and other truck crops. In their

season these are shipped to market fresh or taken to canneries to be prepared for the winter's food. If you look at the map of Long Island, you may say that the east end looks like the open jaws of a huge fish. When autumn brings frost to the mainland, the warm water keeps it away from the long land strips that stick out into the sea at the east end of Long Island. For several weeks after the gardens are dead on the mainland and even on the most of Long Island, the truck farmer of the eastern peninsulas has tomatoes and other truck crops to sell. Now comes the rush of this late harvest. Trucks and trains carry tens of thousands of baskets of produce out of this little section in the two or three weeks of what we may call an extension of summer.

One section of the coastal plain of south central New Jersey has soil that is almost pure sand. Therefore little will grow there and the farmers have shunned it so completely that it may well be called an empty wilderness. It is sometimes called the *Pine Barrens*. Some years ago I took a walk here of seventeen miles in which I did not see a house or a field, only woods, most of which had been ruined by repeated forest fires. My walk was nearly parallel to the railroad between Atlantic City and Philadelphia and about twenty miles to the north of it.

Marshes and cranberries. Parts of the coastal plain are called *salt-water marsh* because they are under water at high tide, but are above water at low tide. This marsh is covered with coarse grass. Other parts of the plain are so level as to be swampy near the streams. Here the water is fresh, and in places the cranberry grows wild. Many farmers grow cranberries in these marshes or bogs on Cape Cod and in northern New Jersey. The red cranberries grow on vines. To keep down the weeds, the farmers build dams so that they can flood the cranberry bogs for a part of the season. When the berries are ready to be picked, the water is allowed to run off. In winter the fields are again flooded to keep the plants from freezing.

Fruit along the lakes. If you should read the temperature day by day through the months of April and May at some point on the south shore of Lake Ontario or Lake Erie, and at some point fifty miles or a hundred miles to the south, you would find that the lake shore was much cooler by day and often warmer by night than a place inland. We have already read on page 371 how this keeps fruit trees from blooming before the danger of frost is past. Because of this protection, the south shore of Lakes Erie and Ontario and the Canadian region between these two lakes has become one of the chief fruit districts of the United States.

In the spring the land is beautiful with the blossoms of apple, peach, pear, and cherry orchards. Fields of grapevines (vineyards) often occupy the fields between the orchards. In autumn, millions of bushels of apples, peaches, and pears go out to many city markets. The little baskets of *slip-skin* grapes may be seen in ten thousand grocery stores from Maine to Florida, to New Orleans and Denver. These grow along the shores of Lake Erie in New York, Pennsylvania, and Ohio. Grapes that come from California at the same time of the year have tight skins.

Connecticut Valley tobacco. The Connecticut River Valley has some terraced lands in Massachusetts and Connecticut, Someone discovered that this soil could be made to produce a very special kind of tobacco if well fertilized and protected

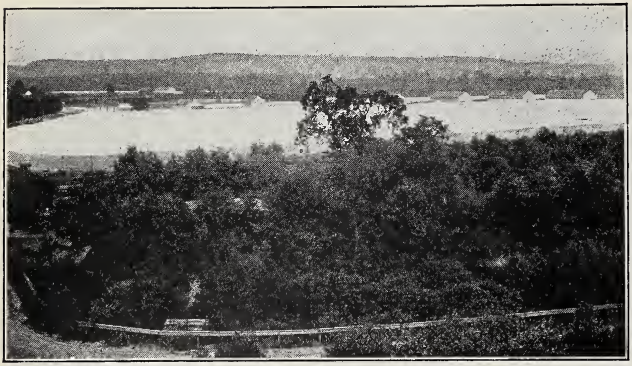


Fig. A. Growing tobacco under thin cotton cloth in the valley of the Connecticut River.

from sun and wind. The shade for the tobacco plants is made by cotton cloth stretched on slats tacked to boards held up by a forest of posts. You may think of this as being something like a greenhouse in which glass and fire make a summer climate in wintertime. The cloth covering of the field makes a damper climate in summer, and several million dollars' worth of special tobacco are grown. Some Connecticut tobacco is also grown in the usual way, as shown in Figure 276-C.

Maine blueberries. Wild blueberries grow in many abandoned fields. In certain sections near the coast of Maine, farmers have found that these berries are not only good for summer markets, but that they can be canned for winter markets. In the winter young trees that might shade the blueberry bushes are bushed off with roaring torches something like those that the plumber and the painter use. This is all the cultivation that blueberries get, and each summer hundreds of boys, girls, men, and women are busy picking this unusual crop.

Aroostook potatoes. One winter day I was making a trip in southern Maine. I happened to be near a railroad which runs from the northern part of that state to Boston. I heard the rumble of a train and saw a very long string of refrigerator cars rushing past. I began to count the cars: twenty, fifty, a hundred, a hundred eighteen refrigerator cars! It was the Aroostook Potato Special bound for Boston, New York, and points south and west. Another train would pass the next day, and the day after, and so on until the end of the season.

In northern Maine in the valley of the Aroostook River, a branch of the St. John, there is a large stretch of sandy loam soil. It is an island of soil in the hard rocks that make up most of the near-by higher lands of upper New England and the neighboring parts of New Brunswick and Quebec. The summer there is short and cool. The late frosts of spring and the early frosts of autumn would make the corn crop a sad failure. But this short, cool summer suits the potato perfectly. It helps to give Maine an average potato yield an acre of 252 bushels, while Virginia, the great potato shipper of the month of June, averages but 127 bushels, and Florida, the potato

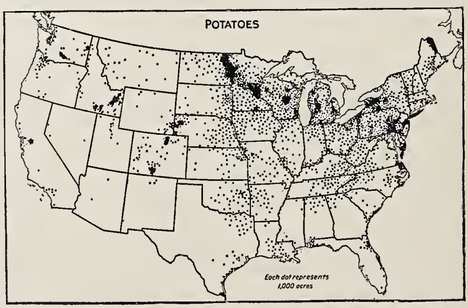


Fig. B. Where are potatoes grown in the state in which you live?

Fig. A. Digging potatoes in the Aroostook Valley, Maine. Aroostook County in Maine produces more potatoes than any state in the Union except Maine.

shipper of February and March gets but 109 bushels per acre. The Aroostook potato growers have studied their business. They use much chemical fertilizer. They spray their potatoes thoroughly and often to kill the blights and bugs. They are like the farmers of the Central States because they have engines to pump the spray materials. They plant potatoes by machinery and dig them by machinery.

Water and crops. How many different things can you tell about how water helps farming in the New England and Middle Atlantic States?

Conversations. 1. Hold a conversation between: A farmer from Aroostook, Maine, and one from the Corn Belt;

2. A dairyman in Vermont and one in Wisconsin;

3. An apple grower in New York and one in Virginia;

4. A tobacco grower in the Connecticut Valley and one in the Ohio Valley.

What is your score? Number eighteen lines down on a sheet of paper. Choose a leader to call aloud the following descriptions. For each description write one or two words on the proper line of your paper.

1. A tall cement tank to keep green corn for the winter.
2. Something that must be used soon after it is produced.
3. The part of New York and Pennsylvania that raises dairy cows.
4. A part of the Northeastern States with farming like that in the Central States.
5. A part of New Jersey that produces truck.
6. A berry crop that grows in marshes.
7. Products from along the lake plains.
8. A crop from the Connecticut Valley.
9. A berry that grows on abandoned Maine farms.
10. A vegetable crop of northern Maine.
11. A grass crop that grows on abandoned fields.
12. A kind of corn canned in Maine.
13. Dairy products produced but little in the Northeastern States.
14. A part of the Northeastern States having late summers.
15. A place with poor, sandy soil.
16. Places where cranberries grow wild.
17. A place protected from spring frosts.
18. A place where summerhouses are made for plants.

Making pictures talk. Let someone be a voice for each picture in this unit. The voice tells the story.

Fig. A. Lumbering, new style. The big tractors are hauling 4600 railroad ties which have been cut from a forest in the Northeastern States. Could the tractors do it without the snow?

THE NORTHEASTERN HIGHLANDS — A LAND OF WOODS AND ROCKS, OF LAKES AND CAMPS

What the maps tell. Look at the map of the land that lies between the St. Lawrence Valley, the Mohawk Valley, and the coast lands of New England (Fig. 387-A). How high is this land above the level of the sea?

This upland was scraped by the great glacier; much of it is hilly, rocky, and mountainous. You can learn things about this rough highland by studying the following maps: rainfall of the United States; snowfall (Fig. 393-A); length of growing season (Fig. 257-A); natural vegetation (Fig. 281-A). What does each tell you about the Northeastern Highlands?

Write two paragraphs telling what men could do with such a country, and what they could not do with such a country. How many things does it have that a corn farmer would not like? Why do some parts of it have very few people?

The good grass of Vermont. One part of this upland region is lower and smoother than the rest, and therefore better for farming. The Connecticut Valley, the Lake Champlain Valley, the slopes of the Green Mountains in Vermont are fine for grass. Here are many farms where dairy cows and fine sheep live on pastures in summer and on hay in winter.

The lumber camp in the North Woods. For many years the farmers of New England and New York have gone to the Adirondacks and the woods of upper New England in the winter, and spent weeks or months in lumber camps. The lumber camp is a log house built to use for a season or two while men cut the logs. Then they move on to a new camp, leaving the old camp to rot.

Lumbering is heavy work. The men must cut down the trees and haul the logs to a mill. The log is often eighteen or twenty or even thirty feet long and a foot and a half to two feet and a half thick. How do you suppose they can handle these huge logs where there is no

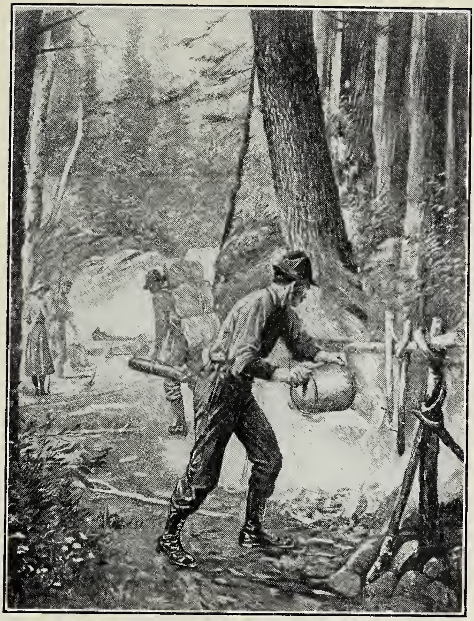


Fig. A. If campers in our forests would carefully put out their campfires as this camper is doing, many dangerous and costly forest fires would be prevented.

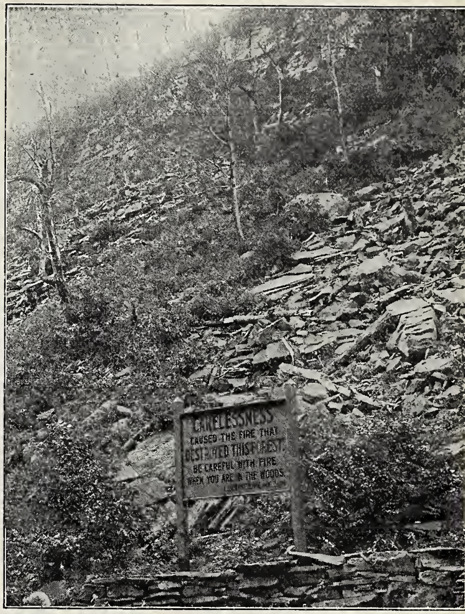


Fig. B. The trees on this hillside were killed by a forest fire. Then heavy rains washed away the rich soil and left bare rocks. Do you see dead trees?

road, but many stones and fallen logs? The snow is as great a help to the lumberman as dogs are to the sheepman of the plains (page 308). After the winter's work is done, there are piles of logs by the banks of the streams or even on the ice in the streams. In spring the melting snow and the spring rains make the streams rise and the logs are floated down to the mills. This is the most dangerous part of lumbering. The men scamper about over the floating logs, working with steel-pointed poles to keep the logs from getting fast in the rocks of the river beds, and thus making log dams called *jams*.

We have cut the trees in our forests much faster than they have grown. In 1929 the forests of the Northeastern Highlands yielded less than a quarter as much lumber as they did in 1899, and they did not yield nearly so much in that year as they had thirty years before that.

The decline of the lumber industry in these forests is one of the reasons why so many farms have been abandoned within fifty or a hundred miles of the forest areas. Once hundreds of farmers had half jobs as lumbermen. The wage money for the winter's work in the woods enabled them to live on the farm. They could not have earned a living only from the farm.

Forestry. Many of the forest lands in this region are now owned by paper companies. The wood that they grow is not made into saw logs, but into pulp wood which goes to market in shorter, smaller pieces that can be made from small trees. Pulp wood is ground to tiny particles by the power of water wheels, put through great tanks of chemicals, and finally turned

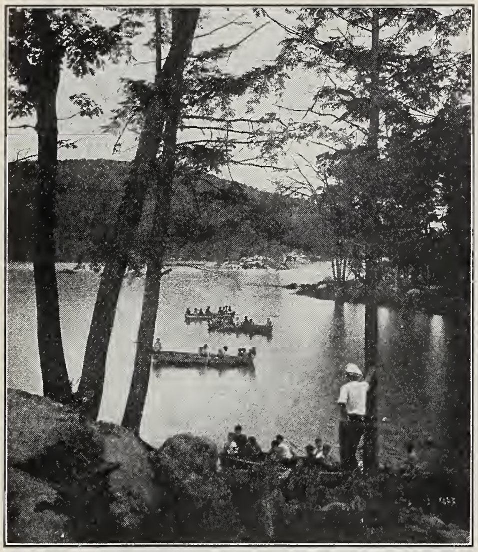


Fig. A. The counselor looks on while the boys from a New England summer camp go rowing.

into paper, in machines that are sometimes as long as two or three schoolrooms. The paper mill is a huge building and is much more costly than a sawmill. The lumberman of the Northeastern uplands, as of the Great Lakes region, has a habit of buying a tract of land, cutting off the trees, sawing the lumber, and moving away with his sawmill. The paper man cannot move his mill without great expense. It is too costly to leave, so he is beginning to take good care of the forests, preventing fires, planting new trees. This is called *forestry*. By this care, his woodland may be a kind of farm yielding wood year after year. Much of the land in the Northeastern Highlands should be kept in forest forever.

Vacation camps. When I was a boy, I read about a boys' summer camp in the New England woods. It was then my idea of heaven on earth.

To many people it is a great pleasure to get into a wild place where no one lives; where the deer, the beaver, and other wild animals are still at home; where for miles you can see only woods, hills, rocks, streams, lakes — things not made by man; where you can go swimming, boating, fishing, walking, climbing. Each summer hundreds of thousands of people go from the cities to the North Woods for a vacation. Some travel through; some stay awhile. There are hundreds of summer camps — boys' camps, girls' camps, sanatoria for people who wish to recover from illnesses. There are hunters' camps where in the autumn men come to hunt for deer.

Many men are expert guides and know all the streams and lakes for long distances. These guides go with hunters or with those who wish to go on canoe trips. The canoe is fitted out with a tent and camping outfit. The canoeist and his guide may go up a river, across a lake, upstream as far as they can go, then carry their canoe and outfit over the divide from one stream to the next. This is called a *portage*, from the French word *porter*, meaning "to carry." Thus they reach the headwaters of another stream and go down that stream. If you want to try a hard journey through an uninhabited land, start in from the south side of this region in New Brunswick or Maine or New Hampshire and go across the divide to the St. Lawrence waters.

Welcome, visitors. Tell how the summer visitor will help:

1. A New England farmer;
2. A dairyman;
3. A carpenter;
4. An automobile mechanic;
5. A hotelkeeper;
6. A storekeeper;
7. A man who lives up in the North Woods and knows many lakes and streams;
8. A man who lives by the seashore.

Fig. A. The famous Boardwalk at Atlantic City and the gently sloping beach good for bathing. Compare with Figure 427-A. Hundreds of excursion trains bring people here every year from dozens of states.

THE VACATION BUSINESS IN OTHER PARTS OF THE NORTHEASTERN STATES

The sandy seashore. Consider Atlantic City, New Jersey. It has just one industry — that of taking care of people who want a vacation beside the sea. It is the largest city in the world where the only industry is that of taking care of visitors. People love the ocean. They love to walk along the beach, to smell the salt air, to feel the fresh, cool breeze, to pick up shells in the sand, and to watch the tide creep up and down, as it does twice a day on the shores of all oceans. They love to go sailing, to bathe in the cool ocean, and to be tossed about by its never-ceasing, roaring waves. The shores of New Jersey and Long Island are fast becoming rows of towns where people from the hot interior seek summer coolness. On Cape Cod are thousands of cottages where families go to spend a pleasant summer.

This North Atlantic seacoast is most easily reached from Pittsburgh, Chicago, St. Louis, and hundreds of other places in the center of the continent. Therefore the settlement of the Central States has helped this resort industry.

Sea breezes. The sea beach is a place where one can nearly always be comfortably cool. When a stranger who is staying at the seashore in the North Atlantic Coastal Plain takes a walk about 9.30 o'clock on a summer morning, he is almost sure to think, "It is getting warm. I fear this will be a very hot day." Suddenly he feels a breeze blowing from the sea. It is a cool breeze and it blows all day. He wonders what has happened. As the hot morning sun beats upon the sea and upon the sand, the sand becomes much hotter than does the water. The sun's rays sink deep into the sea; so they cannot warm its surface very much; but they heat the surface of the sand, partly because they cannot sink into sand as they can into water. Besides, it takes more heat to heat water than it does to

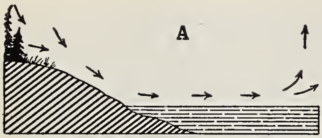
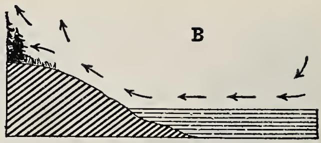


Fig. A.
A shows the wind direction during ☜ a land breeze.
B shows the wind direction during a sea breeze. ☞



heat earth to the same temperature. Thus an hour or two of sunshine makes the sand very hot, while it heats the water only a very little. Because the sand of the beach is heated, the air over it becomes hot, too, and begins to expand. After a few hours the heat has expanded the air on the beach so much that it is lighter than the cooler air over the sea near by. Then the heavy air over the sea pushes the lighter air upward and flows toward the land to take its place. The lighter air over the beach rises, just as a cork in a dish rises when water is poured in.

When the cool sea air flows in to take the place of the hot beach air, we have a sea breeze. The sea breeze blows on the seashore of nearly all warm places, and so the seashore is much cooler in summer than are places inland. The sea breeze does not blow far enough inland, but it may be enjoyed from Cape Cod to North Carolina, from North Carolina to Florida, and on thousands and thousands of miles of seashore in all warm continents, on many, many islands, and on the shores of many lakes.

Land breezes. As sand cools off much faster than water, the land sometimes gets cooler at night than the sea. Explain how it is that there is a breeze from land to sea at that time. Sometimes the west wind blows so strongly in the North Atlantic Coastal Plain that instead of a sea breeze there is a land breeze by day. It is a hot breeze, and it blows millions of mosquitoes out of the swamps that cover much of the flat plain near the seashore. It is not pleasant then to be at some of the beach towns.

New England's rock-bound coast. The coast of New England is the summer home for many thousands of people. This shore does not have the long, unbroken sandy beaches that extend for scores of miles along the coasts of New Jersey and Long Island. From Cape Cod northward, most of the coast is rocky, rough, jagged, ragged granite — red granite or cold gray granite. The waves dash against the rocky coast, splash up, and come tumbling down again in a way that fascinates people. They watch it by the hour as the tide sends its waves higher and higher as it advances, and then slowly retreats again for hours.

The resort business is one of the chief industries of New England. The summer cottage on the rocky beach, like the summer camp on the inland lake, is built by a New England carpenter, roofed by a New England roofer, fitted up by a New England plumber. So far as possible the summer visitor eats vegetables grown by a New England gardener, and gets milk from a New England farm.

The tourist business. Any summer day you may find many thousands of automobiles from other states touring New England and the Middle Atlantic States. They go from the suburbs of New York to the boundaries of New Brunswick, and they also often go on into New Brunswick and Nova Scotia, which are so much like the near-by parts of New England. These travelers from other states visit historic places about which they have read, admire the old New England towns with streets shaded by beautiful elm trees, look at the homes of the sea captains who sailed

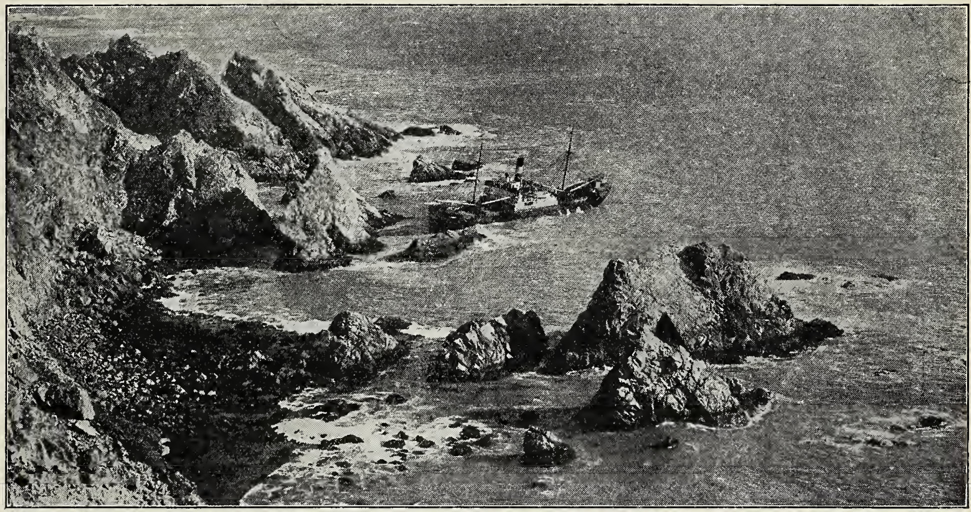


Fig. A. "Stern and rock-bound" describes the coast of much of New England and also of northern California, Oregon, and Washington. This picture was taken off the California coast, but it gives just as good an idea of the coast of Maine. See the freighter fast on the rocks.

around the Cape of Good Hope and Cape Horn in the sailing-vessel days. They buy supplies at garages; at restaurants they buy food; at hotels they buy lodging; at stores they buy other supplies they need, and souvenirs.

Other thousands stay in hotels and farmhouses and tourist camps on seashore, lake shore, hill, and riverside. You can see, can you not, why the resort business is important to New England and her neighbors, and why it is growing?

The Catskill and the Adirondack Mountains. There are many fine hotels as well as many summer homes in the Adirondack Mountains, the Catskill Mountains, and also in some of the mountains of Pennsylvania. Some of these hotels are now open in winter because people come for the winter sports of skating, skiing, and coasting.

A colored map for your notebook. On a blank map of the Northeastern States, shade in yellow and brown the hills and mountains where there is little farming. Shade in green the sandy vacation lands. Shade in purple the rocky seacoast vacation lands. Draw red rings around historic spots in these states. Shade in blue the St. Lawrence River and Lake Champlain. Put a color key in the corner of your map.

Use these correctly. How would you use "land breeze" and "sea breeze" if you were going to the seashore?

Where shall I spend my vacation? Use the maps (physical, rainfall, snowfall, vegetation, growing season) in giving me advice.

a. I like camping in the woods.
b. I like bathing on the beach.
c. I like to visit historic spots.
d. I like hunting and fishing.
e. I like to climb over rocks and watch the sea.
f. I like winter sports.
g. I like to breathe cool, salt air.
h. I am recovering from an illness.
i. I like to go in my automobile with two friends and camp at night in beautiful places.

Stories to tell. Tell the story of:

1. A man who spent the winter in a lumber camp and the spring in a log drive;
2. A boy who spent the summer in a camp in upper New England;
3. A pine tree;
4. A guide with a canoe.

New words to use on your vacation. How would you use "portage" and "divide" if you were going to the North Woods?

THE FUTURE OF THE NORTH-EASTERN STATES

The great St. Lawrence plan. The people of the United States and Canada are working on a great plan to build dams in the St. Lawrence River to get power from it and let ocean ships go up it. What is the elevation of Lake Ontario? The river makes this fall from Lake Ontario to the sea level in many rapids, but there is so much water in the river that steamers go down these rapids with the current. Indeed, the Indians went down in their canoes before the white men came. It must be a great thrill to go whirling through these rapids in a canoe. If you miss the deep water, you probably lose your life. Boats can only go upstream by passing the rapids in canals with many locks to lift the boat to a higher level.

The great plan is to make a series of dams whose total height would be the height of all the falls between Lake Ontario and Montreal.

Ocean ships to the lakes. When the dams are built, large ships can go up the river because there will be deep water in the dams, and there will be locks at the dams to lift the ships from the level of one dam to the level of the next. When this waterway is built, ocean vessels can go to Toronto, Oswego, and other places on Lake Ontario. The Canadians are also planning to deepen the Welland Canal so that large ocean vessels can go on up to Lake Erie.

Giant power plants. The first great use of these dams will be for power. All the water can be made to go through water wheels and, since the river has such even flow, there will be many hundred thousand horse power to divide between the United States and Canada. Do you think this would have any effect on the cities along the Barge Canal, or upon towns that may grow up along the St. Lawrence?

The industries of the future. Will the Northeastern Highlands keep on producing lumber, pulp wood, game, fur, health, and recreation? Is there a reason why this region should change to something else?

How will it be in time to come with the coal mines, the iron furnaces, the summer resorts, the winter sports, the cod fishing, the dairy farms, the paper mills?

The factories. How will it be with a manufacturing town in southern New England, the part that is sometimes called Maritime New England (Fig. 387-A)? Let us compare it with a town on the Great Lakes or with one in the states that touch the Southern Appalachians, or with one in Kansas or California or Washington State, or in Texas or in the Corn Belt.

Let us look first at the factory. We shall compare these different places in:

(*a*) their water power;

(*b*) their coal and oil;

(*c*) their distance from market; that is to say, from many people;

(*d*) their distance from places where iron is made.

Now let us look at the cost of living for the worker in the two places we are studying:

(*a*) the cost of winter clothes;

(*b*) the cost of building a house tight enough for warmth in winter;

(*c*) the cost of warming a house through the winter;

(*d*) the cost of food. Where does the wheat grow that the people eat? Where are the butter and cheese made? Where do the meat animals grow? Where are the canneries that prepare the food?

Does this study of the New England factory town have anything to do with the following facts:

1. In the last fifty years there have been many changes in New England industries. They once made a much larger part of the farm machinery of the country than they do now. This industry went west; first into New York State, then to the Chicago district. New England still makes many articles of metal, but these are pocketknives, clocks, electric machinery, jewelry, hardware, and other fine articles that cost much more per hundred pounds than do the reapers of Chicago. Did your study of two places tell you why New England makes hardware rather than mowing machines?

2. New England textile industries once made a much larger part of the cloth of the country than they do now, but New England now makes a much larger part of the finer grades than she does of the coarser grades of cloth.

3. The New England businessmen's organizations are working very hard to find new industries for their towns.

4. There are many schools in New England where people are taught how to do fine work in factories.

Other comparisons. You might make exactly the same kind of comparison between a factory in some distant place and one in (1) a town on the Hudson River; (2) on the New York Barge Canal; (3) a town in eastern Pennsylvania.

What would be one of the big differences you would first point out between the town in New England and the town in the Erie Canal Belt? between the town in New England and the town in Pennsylvania?

What would you say about the future of the town in the Appalachian Plateau, where the people make their living by mining coal, and the town along the Barge Canal, where the factories are run by electricity from Niagara Falls?

The map. 1. Make a cut-out map of the states.

2. Make a blank map of the Northeastern States. Color green all that is below 500 feet above the sea; brown all that is over 2000 feet. Put on it the Barge Canal, Champlain Canal, and the names: White Mountains, Green Mountains, Catskills, Adirondacks, Mohawk Valley, Lake Champlain, Champlain Canal.

3. Tell why you think (a) Johnstown and Altoona are on the main railroad line between Philadelphia and Pittsburgh; (b) Scranton on one between New York and Buffalo; (c) Springfield, Massachusetts, on one between New Haven and Vermont.

4. Which locomotive has the harder job, the one pulling a train from (a) Scranton to Harrisburg or Scranton to New York; (b) Albany to New York or Albany to Boston; (c) Portland to Montreal or Portland to Boston?

Number, please. Copy the following list. Beside each name write the number that locates the place on the outline map:

Nova Scotia	Adirondack Mountains
New Brunswick	Maine
Vermont	New Hampshire
St. Lawrence River	Erie Canal
Merrimack River	Lake Erie
Massachusetts	Lake Ontario
Rhode Island	Niagara Falls
Connecticut	New Jersey
Cape Cod	Delaware River
Nantucket Island	Schuylkill River
Connecticut River	Pennsylvania
Long Island	Susquehanna River
Lake Champlain	Appalachian Mountains
New York	Ohio River
Hudson River	Allegheny River
Mohawk River	

A vacation journey. Suppose you lived in one of the Central States and took a long automobile vacation journey in the Northeastern States. Tell about your journey and what you would see.

Make a speech. Let members of the class tell what the following people might think about the new St. Lawrence waterway and the enlarged Welland Canal: a man from New York City; from Albany; from Buffalo; from Duluth; from Montreal; from Chicago. Let two speak for the *United States*.

Debate. Let two teams debate this question: *Resolved*, That the ancient glaciers did more harm than good to the United States.

Fig. A. The home of Cristobal Garcia, the *patch-and-thatch* farmer whom you will read about in the following story.

OUR ISLAND POSSESSIONS

THE PATCH-AND-THATCH SYSTEM OF THE WARM LANDS

As you read this story, try to discover why we call it *patch and thatch.*

The patch farmer. I once visited a farmer in the mountains of Puerto Rico. His name is Cristobal Garcia.

When I first saw Cristobal he was bending over in his garden. He had a long knife (*machete*) in his right hand, and he was skimming its blade along just under the top of the soft earth. The sharp blade cut off the weeds that were coming up between his yucca (*cassava*) plants. Cristobal got a hoe and dug up a plant for me. Its roots were as long as your arm. As a food, the roots are much like the sweet potato; but if Cristobal had eaten his cassava roots raw, he would probably have died of poisoning that very afternoon. Long ago some Indian found that when this root is boiled, the poison is gone and the root is good to eat. As long as it is uncooked, the poison will prevent ants, rats, and other vermin from eating it; so the poison is really a good thing.

Cristobal's garden had several banana plants that bear bananas like those you eat. Also he had some plantains, or cooking bananas. There were a few rows of beans and several leafy plants I had never seen. The leaves of these plants are eaten very much as we eat lettuce, spinach, and cabbage. Cristobal also had a little patch of sugar cane. Everyone liked to suck a piece of cane to get the sweet taste of sugar. The family got coffee and *avocados* from their own trees. The avocado is a fruit that looks somewhat like our pear,

but its pulp has in it a fat much like butter or bacon.

No beast of burden. Cristobal has no plow and no horse to pull one. He has no cow. He has only an acre and a half of land, and part of that is in woods. He cultivates his little patch with a hoe and the machete. He has a hen and chickens, and a goat that finds green things to eat all the year and gives a little milk.

The thatch house. Cristobal and his fourteen-year-old son made their house. They set posts in the ground, put a framework of poles on top of the posts, and made the walls and roof of long grass or of palm leaves. Such a roof is called a *thatch roof.* It keeps out rain and sun, and that is all that a house need do in a climate like Puerto Rico and that of many other countries that have no winter.

Cristobal's wife makes the fire and boils the pot just outside the door. If she wishes more shelter while cooking, a little porch roof of leaves can easily be made on poles. When she makes a fire inside the house the smoke comes out of the top.

The home supplies itself. With his machete and a chisel, Cristobal makes chairs from the branches and trunks of trees. He uses the chisel to cut holes in which to put the legs of the chair. The seats are of string made by twisting tough grass and palm-leaf fibers. Homemade hammocks serve for beds. The only things the family has to buy are a few cheap cotton clothes, the machete, the hoe, a pot in which to boil cassava, a skillet for frying, salt, and a bucket to carry water from the spring. A gourd vine gives them drinking cups.

How does Cristobal get the little money which he needs? He has a few coffee trees. They yield a few dollars' worth of coffee beans. He carries the coffee many miles to town on his back and sells it to a merchant who sends it to New York. Perhaps you have seen it. Cristobal may also work for wages a few days in the year on the coffee plantation of his neighbor. He works only when he needs food or money. You can now tell why we call this system of making a living the *patch-and-thatch system.* The Indians started it long before Columbus came.

The coming of the white man has made life easier for the patch-and-thatch farmer because he can sell or trade a small amount of some product, such as cacao beans, coffee, fiber, tobacco, or coconuts. Thus he gets the few things he needs to buy.

On the map of the world find the United States. Find the lands that belong to the United States. These lands are called *Our Island Possessions.* They are all islands. Copy the following chart and fill it in. The Appendix will help you with the figures.

Island Possessions	Area	Population	People per Square Mile

My State	Area	Population	People per Square Mile

By looking at these numbers, would you say that these islands are or are not densely populated?

As you study this chapter, keep thinking of these questions:

1. Why are there so many people living in our island possessions?

2. In what ways are the lands and the people different from those of the United States?

3. What are the reasons for these differences?

Fig. A. San Juan, Puerto Rico, showing a part of the water front.

A TRIP IN PUERTO RICO

Puerto Rico is a beautiful, densely populated island. Most of the land is hilly or mountainous. For this reason it is well drained and, therefore, much more healthful than many tropic countries. The greater part of the people are of the Spanish race, because this island was for a long time a Spanish possession. Most of the people make their living on small farms, where they grow bananas, fruit, sweet potatoes, cassava, beans, and other garden vegetables, and keep chickens for their own use.

The villages nestle under graceful palm trees. On the coastal plains the light green fields stretch in a broad band beside the sea. Your trip by motor will be delightful because there are good roads everywhere. You can reach even the high valleys where coffee is grown.

The tin roof, the store, and the job. You have learned about the patch-and-thatch system in the warm lands. In this village you will see the other way that men have of making a living in the warm lands — the *tin roof-store-job system.* The houses in this village are close together. A few coconut and other trees stand near them, but the gardens are very tiny indeed. The people cannot spare enough ground to grow thatch for roofs. Instead, they make roofs of sheets of iron from American mills. The village is surrounded by a sea of sugar cane. In the distance it looks silvery green. Near by it is somewhat like a field of corn, only the canes are taller than corn. All the land belongs to a sugar company whose head office is in New York City. That small boy you see coming out of the little store sucking one end of a long green and purple stick is getting the sweet juice of the sugar cane. Cane is the candy of these lands, and all children, the world over, love candy.

The people who live in this village work in the cane fields for wages. With the money they earn they buy their food at the store instead of raising it in their gardens. In the store you will find barrels of salt pork from Chicago, cases of lard from Kansas City, boxes of dried codfish from Newfoundland, corn meal and hominy from Baltimore, canned goods from many places. If the price of sugar is high and everyone has work, there is enough money to buy what is needed. If the price of sugar is low and wages are low, some of the people cannot get a job. Without a job a family in this village will suffer more than a family in a little thatched house back in the hills (page 430). Tell the class why this is true.

The sugar plantation. Beside this village you see a huge sugar mill with its tall smokestack. The mill uses the sugar cane which is grown here. Growing sugar cane is much like growing cotton (page 256).

Tractors and plows made in factories in the United States are often used to prepare the Puerto Rican cane fields for planting (page 273). The cane plant, like the cotton plant, requires warm weather and plenty of rain. Much work with the hoe is needed to keep out weeds. When the cane is young, rows of men and boys from the village may be seen hoeing in the fields that surround the village on every side.

In about a year the cane is tall, full of sweet juice, and ready to be harvested. Men cut down the stalks and send them to this sugar factory or mill. Sometimes the cane goes to the mill in oxcarts, sometimes in little railroad cars pulled by a locomotive about as large as a small automobile. The locomotive and railroad cars run on a track which is laid down in the fields and afterwards taken up and moved to another place where it is needed.

The sugar mill. In the sugar mill the cane and juice are handled in the same way as in Louisiana (page 273). The stalks that remain after the juice is pressed out are burned to make steam to run the engines.

The sugar is put into sacks and taken to San Juan, usually by way of the railroad. There the sugar is put aboard steamers for New York.

Tobacco fields. As your automobile enters some of the mountain valleys, you see great white things that make you think of snow fields or glaciers. But you soon discover that here are tobacco fields covered with cotton cloth like those of the Connecticut Valley. The cloth cover makes a perfect climate for certain kinds of tobacco; it also keeps insects from injuring the plants. In Puerto Rico, tobacco is the export next in importance to sugar. Not all tobacco fields in Puerto Rico are protected by cloth; many are uncovered.

Coffee and grapefruit. Farther up in the hills are some coffee plantations, from which sacks of coffee are shipped to New York and Europe.

Among the sugar fields are grapefruit plantations. Their fruit comes to the American market at times when the orchards of Florida and California do not produce grapefruit. Together, these crops do not take up nearly so much land or so much labor or bring in so much money as sugar, the main crop of the island.

Sugar ships. At San Juan, the capital, you notice that many people are busy putting sacks of sugar aboard a steamer. Not only now, but all day long, sack after sack of sugar passes over the ship's side and into the hold. The next day and the next the loading will keep on. It would take seventy-six islands the size of Puerto Rico to make one Texas, but this one

little island sends to the United States enough sugar to fill, every day in the year, about seventy freight cars.

The sugar trade. Of course you like sugar. Although we produce a lot of it in the United States (Fig. 273-B), sugar is also one of our chief imports. There is much trade in sugar, for many countries grow it and many countries import it. Sugar was once very scarce and costly, but now it costs so little that boys and girls have more sugar than kings and queens had when Columbus crossed the ocean. This happened because of inventions such as steamboats, trains, better crushers, better refineries, steam plows, better varieties of cane, and better fertilizers.

In 1931 there were millions of tons of sugar left over from the year before, and the price fell so low that the planters were losing money and the people of Puerto Rico were very poor indeed.

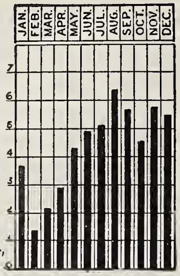


Fig. A. Rainfall of San Juan, Puerto Rico. San Juan, as you see from Fig. 436-A, is on the northeast coast of Puerto Rico, toward which the rain-bringing northeast winds blow.

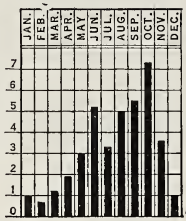


Fig. B. Rainfall of Ponce, Puerto Rico. Notice on Fig. 436-A that Ponce is on the southwest coast of Puerto Rico. Why does it have less rain than San Juan?

Puerto Rican needlework. The women of Puerto Rico are very skilful with the needle. While the men are working in the sugar fields and loading sugar ships, hundreds of their wives and daughters make embroidery and clothing to be sold in the United States.

A "To-Be-Continued" map. On a blank world map draw a red line to show how you would go from your home to Puerto Rico. Using the scale of miles, measure how far you would have to travel by sea; by land. Write these distances under your red line. Save this map in your notebook, so that you can show how to visit the other possessions of the United States.

Draw a colored free-hand map of Puerto Rico inside a rectangle twice as long as it is wide. Draw the meridian 66° W. and the parallel 18° N. that cross this island. Color the mountains and the plains. Show the harbor of San Juan. Color the ocean around the island.

Cristobal's farm and ours. Separate these words into two lists, headed "warm-island farm" and "temperate-zone farm":

farm laborers	hoes
chickens	silo
goats	cows
sheep	paved roads
fenced fields	threshing machines
trucks	cattle barns
machetes	fruit orchards
tractors	pastures

Dinner with Cristobal. From the following list, copy the foods that Cristobal might give you for dinner:

potatoes	sugar
bananas	leafy vegetables
beans	chicken
cream cheese	coconuts
ice	avocado
tea	bread
cassava	coffee
apples	plantains
beefsteak	butter

Cristobal's reasons. Give the number of the part that fits each sentence; or, if you have time, write the whole sentence correctly.

He works in a coffee plantation because
He raises some cacao beans because
He buys little food because
He hires no farm helpers because
He builds his house of light material because
He buys no food for his chickens and goat because
He needs little money because

1. *The climate is always warm.*
2. *He earns money to spend in the store.*
3. *His farm supplies only his own needs.*
4. *His home supplies itself.*
5. *His patch gives him all he needs.*
6. *There is green grass all year.*
7. *He can sell them for money.*

Can you give reasons for the following?

Why the Puerto Ricans speak Spanish.
Why they are interested in the price of sugar.
Why people can live cheaply.
Why sugar is the main money crop.
Why they buy instead of raising food.

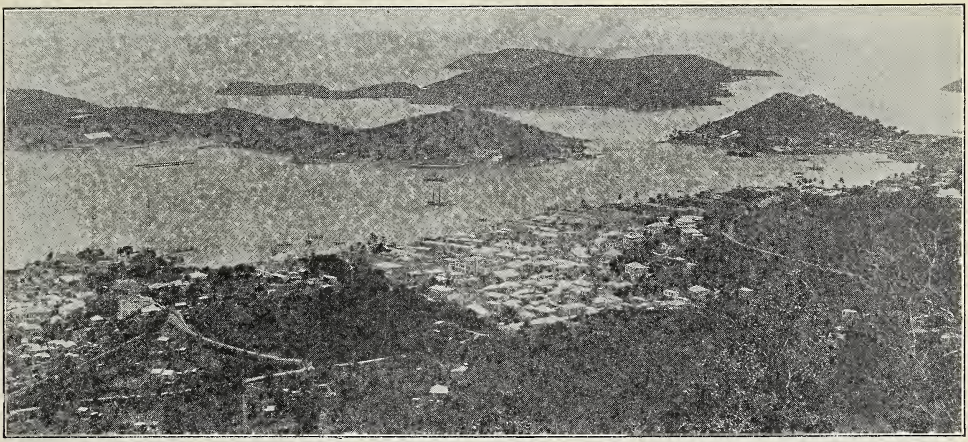


Fig. A. The harbor and town of St. Thomas, Virgin Islands. See how the low-lying islands protect the harbor from the big waves of the open sea.

THE VIRGIN ISLANDS

Uncle Sam buys land. On a clear day you can see the Virgin Islands from the east end of Puerto Rico. The United States bought the Virgin Islands from Denmark in 1917. When we bought them we did not really buy the land. We merely bought the *government* of the islands. We say that they are a United States possession, but nearly all the land still belongs to thirty or forty Danish sugar planters who have owned it for many years.

Making a living in the Virgin Islands. There are about 500 white people and 21,500 Negroes on the islands. For a number of reasons, business got worse in the Virgin Islands and many of the people went to New York City, where hundreds of them work. The government is now trying to get the people back to the patch-and-thatch system by helping those who once worked on the sugar plantations to buy small tracts of land from owners of the large plantations. The government is trying to get them to raise their own food on their own little farms, and some more which they may sell. They sell some fine needlework and baskets.

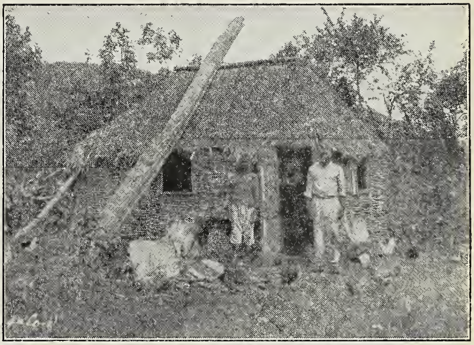


Fig. B. A wattle hut in the Virgin Islands. Look up *wattle* in your dictionary. Then tell how the sides of this hut were built. The roof is thatched.

THE PHILIPPINE COCONUT AND HEMP GROWERS

The coconut grove. Thump-thump-thump, thump! It was the sound of coconuts falling from the palm trees, where they had hung high up near the top at the base of the long leaf stalks (Fig. 437-A). All night long they fell as the storm wind blew. Emilio was glad he was not out there under the trees, for a falling coconut sometimes kills a man.

Emilio lives on the island of Luzon, one of the Philippine Islands. He is of the Tagal race. His skin is brown, much like

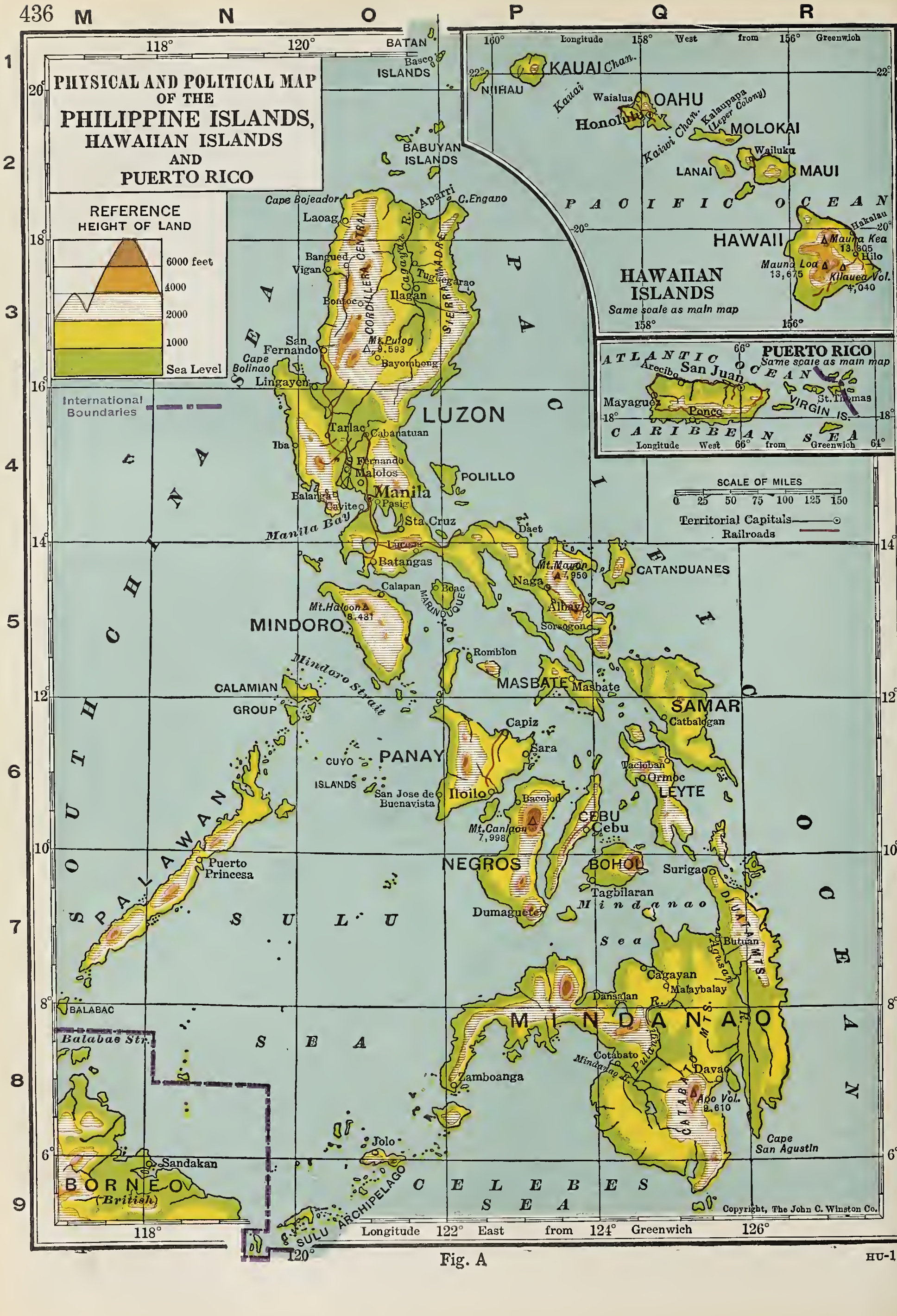

PHYSICAL AND POLITICAL MAP OF THE PHILIPPINE ISLANDS, HAWAIIAN ISLANDS AND PUERTO RICO
REFERENCE HEIGHT OF LAND
6000 feet
4000
2000
1000
Sea Level
International Boundaries
SCALE OF MILES
0 25 50 75 100 125 150
Territorial Capitals
Railroads
LUZON
MINDORO
PANAY
NEGROS
CEBU
BOHOL
LEYTE
SAMAR
MASBATE
MINDANAO
PALAWAN
CALAMIAN GROUP
CUYO ISLANDS
BABUYAN ISLANDS
BATAN ISLANDS
POLILLO
CATANDUANES
MARINDUQUE
SOUTH CHINA SEA
PACIFIC OCEAN
SULU SEA
CELEBES SEA
Mindanao Sea
Mindoro Strait
Manila Bay
SULU ARCHIPELAGO
BORNEO (British)
Balabac Str.
BALABAC
Manila
Cebu
Iloilo
Zamboanga
Jolo
Sandakan
Puerto Princesa
Mt.Pulog 9,593
Mt.Mayon 7,950
Mt.Halcon 8,481
Mt.Canlaon 7,998
Apo Vol. 9,610
HAWAIIAN ISLANDS
Same scale as main map
KAUAI
NIIHAU
OAHU
Honolulu
MOLOKAI
LANAI
MAUI
HAWAII
Mauna Kea 13,805
Mauna Loa 13,675
Kilauea Vol. 4,040
PUERTO RICO
Same scale as main map
San Juan
Ponce
Mayaguez
Arecibo
VIRGIN IS.
St.Thomas
ATLANTIC OCEAN
CARIBBEAN SEA
Longitude 122° East from 124° Greenwich
Copyright, The John C. Winston Co.

Fig. A

that of the Malays. Some of Emilio's ancestors were Malays. His hair is straight and black. He speaks a little Spanish and he has a Spanish name, because the Spanish people once ruled his island.

For a month before the storm, Emilio had done nothing but swim in the river, fish, paddle about in his canoe, and swing in a hammock. Maria, his wife, had been keeping the weeds away from their twenty banana plants and from the sweet potatoes, peppers, and climbing beans that grow in their little garden. She also kept tight the stick fence around the garden, so that the pigs could not get in and root up the sweet potatoes. The pigs had to hunt in the woods to get roots, worms, and nuts for food. Maria fed them just enough to keep them in the habit of coming back home, else they would have become wild pigs of the forest.

The morning after the storm Emilio called his sons, Juan and Ninoy, aged fifteen and thirteen, and their sister Isabel, and the family went to work picking up coconuts. Because it is hot in the Philippine Islands, the family started to work at dawn and stopped to rest at eight o'clock in the morning.

They then had a breakfast of fish and sweet potatoes; after this everybody took a long nap. At four o'clock, after a swim and a lunch of bananas, everyone went to work again. By dusk there were two thousand coconuts in a pile by a shed in the middle of the grove. Some of the coconuts had lain in the grass ıɔr a month; the thick husks and hard shells protect the meat inside the fruit.

Making copra. The next day the family husked the coconuts, and Emilio split the hard shells with his long, sharp, heavy knife. The meat could then be pulled out — two pieces from each nut.

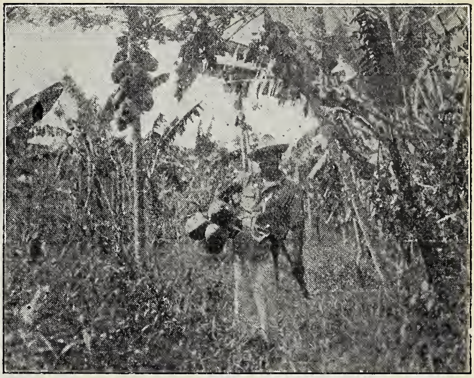


Fig. A. After the storm, Juan was able to gather an armload of coconuts. The fruits over his head are papayas. They are much like melons.

Fig. B. After you have read the story, tell what Emilio and Ninoy are doing.

Isabel and the boys spread the pieces of white coconut meat, layer above layer, on shelves in the drying shed. Below the shelves a pit was dug in the earth, and in the pit they built a fire which they kept burning for several days. The fire dried the meat of the coconuts. For fuel they used coconut husks and the big ribs of coconut leaves that fall each year from the trees.

In some places where it does not rain so much as where Emilio lives, the nuts

Fig. A. Romulo grows abaca. What is made from this plant? For what is it used?

Fig. B. After you have read "Hemp" on this page, tell what Romulo is doing.

are dried by being spread out on wooden trays in the hot sun. In the evening the trays are carried into a shed to keep the dew from the nuts. Each morning the trays are put out in the sun. If rain comes, everyone scrambles to put the coconut meats into the shed. Wetness spoils coconut.

In a week Emilio's coconut meats are dry, and Emilio sells them under the trade name of *copra*.

Going to market. Emilio, Ninoy, and Juan pushed a canoe out of the bushes on the bank of the creek. The canoe had been dug from a single log. They put several big baskets of copra into the canoe and paddled downstream for two hours, until they reached the mouth of a creek which flowed into a safe little bay.

Once every month a little steamboat comes to this bay on its way from Manila to Iloilo. It anchors near the mouth of the creek and, all day long, rowboats and canoes carry things back and forth between the steamer and the little town upon the shore. Boxes, bundles, and sacks go ashore to the stores of the Chinese merchants, who do all the trading in the town. Some of these boxes, bundles, and sacks come from England and France; some come from India, China, and Japan; many come from the United States. If you could open those packages and read the names on the boxes and cans, you would see many American names — names of southern cities that make cotton cloth, and of New England cities that make knives, needles, and thread; of towns in the farm and fruit belts where food is put into tin cans. Emilio's canoe is only one of many that have brought copra to the steamer.

Hemp. Canoes also carry bundles of manila hemp to the steamer. Hemp is a long, strong fiber and it is made into the best of rope at factories in Chicago, Philadelphia, Boston, and other places in the United States.

One of Emilio's neighbors, Romulo, grows hemp. While Emilio and his family were preparing copra for the market, Romulo was at work (Fig. 438-B) under a tree beside his plantation of abaca (*manila hemp*). This plant looks like the banana plant. It is indeed a member of the banana family, but its leaf, not its fruit, is used. Romulo tears off a leaf whose stem is five or six feet long; he puts

the leaf in the scraper shown in Figure 438-B, grasps the end of the stalk, and pulls it through the scraper. All the soft, fleshy part is scraped off, and a bunch of long, strong, white fibers remains. When these have been dried in the sun, Romulo ties them in bundles and the hemp is ready for market. Hemp is one of the important exports of the Philippine Islands.

The water buffalo. Besides the copra and the hemp which were to go by steamer to Manila, were a few bundles of tobacco and four big, fat water buffaloes to be sold. Water buffaloes, or carabaos, are the Philippine cattle. The carabao is also the ox of the Philippine Islands; he pulls wagons, carts, and sleds; he plows the farmer's rice fields. The wild buffalo is a swamp animal; he likes to lie buried in mud or water with only nose, eyes, and ears sticking out.

How would you get four carabaos into a ship that lies out in the water? Their owners made them swim out to the steamer. Then a rope was put around the horns of each buffalo, and a little engine hoisted him up, scared and kicking, to the boat.

This was thrilling for Juan and Ninoy, and they spent the afternoon watching the work around the steamer. Emilio sold his copra to one of the Chinese storekeepers, and in the evening he and the boys went home, taking a hundred-pound sack of rice with them. The family eats no bread, but, instead, uses rice, sweet potatoes, and bananas.

Each day, for three more days, Emilio and the boys took a canoeload of copra to the steamer. In all, they sold fifty dollars', or over a hundred pesos', worth, and no one in that family had to work again for many weeks.

Trading with all the world. What do you suppose that Emilio bought with the hundred pesos? He bought some rice from French Indo-China; a red cotton dress from England for Maria; two combs from France; some glass beads from Venezia (Venice), Italy; a coconut knife and a hatchet from Massachusetts; a cheap clock from Connecticut; some white cotton cloth from South Carolina; some canned meat from Chicago; and some canned peaches from California. These things he bought from the Chinese store in the town. The Chinese got them from the American wholesale store in Manila, and the wholesale store in Manila got the things from export stores in San Francisco, Seattle, New York, London, and Hamburg. Show the routes that the steamers took

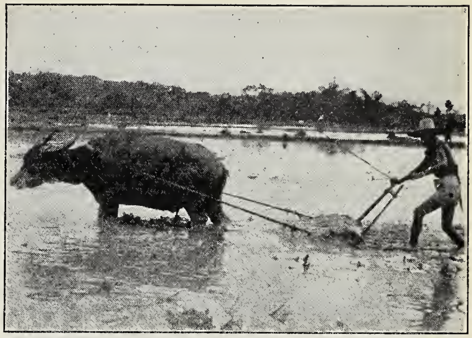


Fig. A. One of Emilio's neighbors is plowing a field in which he will plant rice. The water buffalo, or carabao, does the pulling.

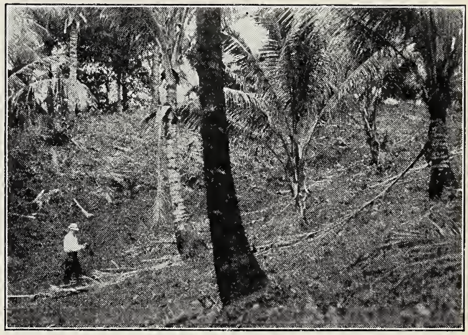


Fig. B. I decided to risk being hit on the head by a falling coconut, in order to get one with its husk on from this coconut grove in the island of Luzon.

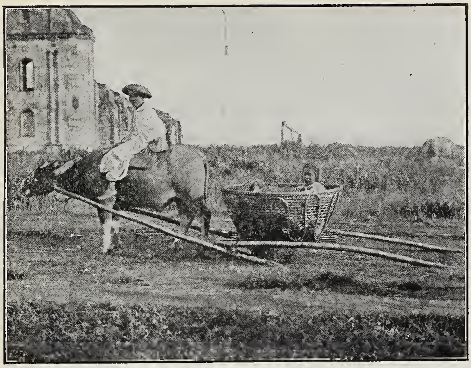


Fig. A. A carabao sled as used in the Philippines.

Fig. B. Transporting oranges to market in the Philippines.

as they carried these goods to Manila. (See the political map of the world.)

One of Emilio's packages was wrapped in tough brown paper, called manila paper. This paper was made from some old manila-hemp rope that had been worn out on a Gloucester fishing schooner. The rope was then made into strong paper at Holyoke, Massachusetts, beside the waterfalls of the Connecticut River.

While Emilio and the boys took the copra to market, Isabel and Maria made hats that look like those we call *Panama* hats. They were made of grass fibers plaited by hand. It requires great skill to make a good hat.

Uses of coconut. Some of the copra that Emilio sold was crushed by heavy machines at a Manila oil mill, to get the oil. Twenty pounds of copra yield a gallon of oil. Some of the Philippine copra finds its way into oil mills of other countries.

A few years ago a chemist learned how to mix coconut oil with milk and other things. The mixture tastes like butter made from cows' milk. It is much cheaper than butter and the people in England, Germany, and other countries of Europe eat as much of it as they do of butter made from cows' milk. We are also using much of this palm-tree butter in the United States, and therefore the coconut is becoming more important than it once was.

A coconut forest. In the hills of Luzon, south of Manila, I have ridden for forty miles through a forest of coconut trees, which extended back from the road on both sides as far as I could see. Along this road were many villages where coconut growers lived, and I saw hundreds of boys and girls going to school. They were all neat and clean and most of them were dressed in white. Some of their fathers sold copra; some sold fresh coconuts to a Scotchman who had a large factory where he made shredded coconut. Perhaps you have seen shredded coconut at the grocery store, or have eaten it on a cake or in pie.

Other Philippine Industries and Peoples

Most of the land in the Philippine Islands is mountainous. The coconuts and the abaca grow nicely on the hills; for the ground does not need to be cultivated for these plants. All man has to do is to take the ax, or machete, and cut down other plants and trees that may be crowding those he needs.

The island of Luzon has one large, level plain which extends north from Manila

between the eastern and western mountains. There are many large sugar plantations on this plain and on a number of smaller plains along the shores of some of the other islands. These plantations are run very much as are the sugar plantations of Puerto Rico (page 433).

Peoples of the Philippines. Examine carefully the scale of the map (Fig. 436-A) and tell three places to which the Philippine Islands would reach if one end of them should be placed at your home. There are many islands, hundreds of them, and many different kinds of people. Most of the people are of the Tagal race. These people are partly of Malay stock. Their ancestors came across the sea from Asia in boats long ago. They took possession of the best shore lands. Most of the people on all the shore plains and in the city of Manila are Tagals. They are intelligent people who have wonderful memories. I have heard boys and girls in the schools of Manila recite a page of their history lesson without forgetting a single word.

In the mountains of Luzon and many other islands there are other peoples, speaking other languages. We might almost call them hidden peoples. Their hill lands are covered with thick forests, bushes, and climbing vines. One must often cut a path before he can travel there. Many a village has never been seen even by the Tagals. Some of these hidden peoples are brown; some are black. Some are food gatherers and hunters; that is to say, they live on what they can find, like fruits, nuts, and roots, and on what they can catch with traps and snares or kill with bows, arrows, and spears. These were probably the earliest inhabitants. The Malays came and drove them back into the interior. Most of the other peoples of the forest live by patch-and-thatch.

Fig. A. These Igorot girls have come from their mountain homes to market in Baguio, a famous summer resort in the mountains of Luzon, Philippine Islands.

Fig. B. This house of bamboo and thatch is at the edge of a coconut orchard in Luzon.

The Igorot. Perhaps the Igorots are the most interesting of the patch-and-thatch people of the Philippine mountains. Their patches are indeed wonderful, for the Igorot grows rice on the sides of hills. These people began hundreds of years ago to make level places on the hillsides, digging and piling the earth to form terraces. They then built banks of earth and stone to hold water on the little fields they had made. They made little ditches to carry water from some mountain stream along the mountain side to irrigate their rice fields. As the years went by, they added terrace after terrace until the mountain sides at Bontok, in northern Luzon, are made into terraced rice fields much

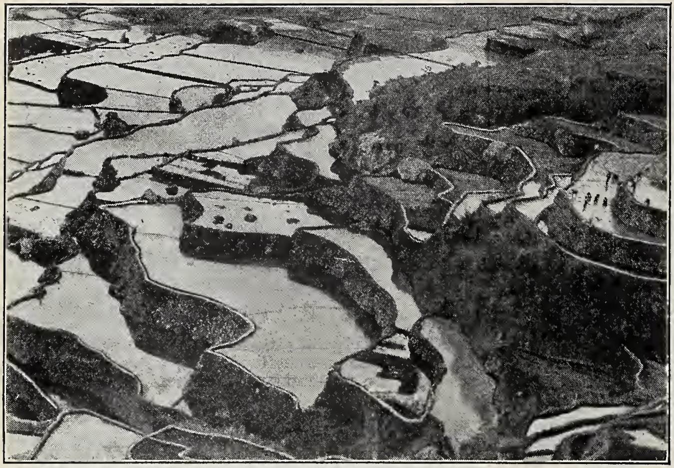


Fig. A. Read the paragraph, "The Igorot," which begins on page 441 and then tell about this picture.

like giant water steps (Fig. 442-A). There is not in all the United States a farm whose fields have required so much labor to make them ready for use.

On the top of each of the steps, or terraces, the water at one season shines in the sun like silver, and at another season the steps have a green carpet of young rice plants, and later a golden yellow carpet of ripe rice. Sometimes it appears from a distance to have ants crawling slowly over it. These are the Igorots harvesting their rice with a knife in one hand and a handful of rice in the other, as their fathers and grandfathers have done since long before the day when Magellan sailed the first European ship into Philippine waters. Some of these Igorot boys walk for two or three days to reach a school that the Philippine government has made for them in the edge of the mountains.

There are many home industries in the valleys and on the plains. One tribe may be famous for weaving cloth; another for blankets, or pottery, or wood carving. The people often gather once or twice a week at some place where they have a market. People for miles around go to the market to sell things they have made or grown. At a famous market in Baguio you can buy really beautiful things that the mountain people have made.

Add to your "To-Be-Continued" map a red line to show a trip to Manila.

A free-hand map made easy. Draw the parallels 6° N., 8° N., etc., to 20° N., one inch apart. Over these draw the meridians 118° E., 120° E., etc., to 126° E., one inch apart. On this "net" it is easy to copy from the map (page 436) the larger islands of the Philippines. Show Luzon, with Manila, Manila Bay, the mountains, the plains, the rivers flowing into the bay. Choose other islands of the group and put them on your map.

A meeting place for ships. On a blank map of the world draw blue lines to show how ships come to Manila from all parts of the world. Above the lines, print neatly the names of the articles they bring; below, the names of the articles they take away.

Where things grow. On your map write *C*, *A*, and *S* to show where the principal crops of the Philippines are grown. Why do we not include rice among the principal crops?

Lecturer at a picture show. Let everyone look at Figures 437-A, B. Choose one child for lecturer to tell the story of Emilio's work with his coconuts. Use the following outline:

The tree.
Gathering the nuts.
Husking the nuts.
The weather, and two ways of drying the meat.
Selling the copra in town.

While everyone looks at Figures 438-A, B and at the map (Fig. 436-A), have the lecturer tell the story of Romulo and his hemp, using the following outline:

The abaca plant.
Scraping the leaf.
Drying the fibers.
Shipping the bundles.
Using the fibers.

Fig. A. Gathering pineapples in Hawaii. This fruit will be canned and then started on its long journey to the grocery store in your neighborhood. Trace the journey. (See world political map.)

HAWAII, VOLCANOES, AND TRADE WINDS

The volcano's children. We might say that the Hawaiian Islands are children of the volcano. A volcano is a place where melted rock (*lava*) rises through a break in the earth's crust and runs out. The hot lava soon cools and piles up around the hole from which it flows, until finally it makes a mountain (Fig. 443-B).

The Hawaiian Islands are the tops of mountains that were built up from the bottom of the sea by lava from the volcanoes. The largest of the volcanoes, Mauna Loa, has an opening or crater big enough to hold a city. Melted lava boils and splashes around in the crater. At night the hot lava lights up the sky brilliantly. Every few years the crater overflows, and the stream of lava runs slowly down the mountain side, covering fields, burning forests, and sometimes even running into the sea, where it makes the water boil furiously and kills the fish.

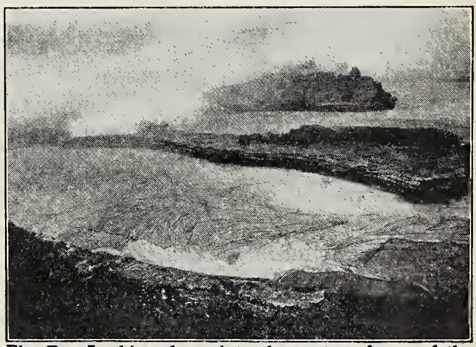
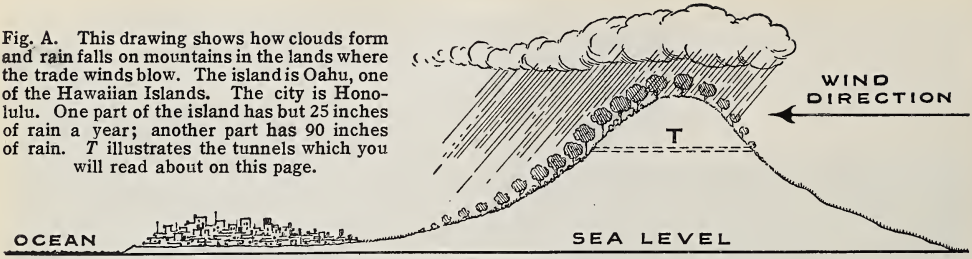


Fig. B. Looking down into the crater of one of the many active volcanoes in the Hawaiian Islands. See the lava boil and bubble.

The volcano and the farmer. Often when a volcano is active, there are great explosions which blow the lava into clouds of dust that cover the country like snow for miles and miles around. This sometimes happens because, deep in the ground, water is mixed with the lava.

Fig. A. This drawing shows how clouds form and rain falls on mountains in the lands where the trade winds blow. The island is Oahu, one of the Hawaiian Islands. The city is Honolulu. One part of the island has but 25 inches of rain a year; another part has 90 inches of rain. *T* illustrates the tunnels which you will read about on this page.



The heat of the lava turns the water to steam, just as the water in an engine boiler is turned to steam. As the steam gets near the surface of the ground, it blows up, as do engine boilers sometimes. In this way the lava is blown into fine pieces and sent up into the air. The big pieces of lava fall close to the opening, or crater, and help to build up the mountain. The fine pieces form great clouds which look like clouds of smoke, but finally fall as dust, often called volcanic ash. The explosions can sometimes be heard at a distance of a hundred miles or more.

After many years the lava decays, and splendid crops of cane are grown on the land it forms (page 335). The Philippine Islands have many volcanoes and much volcanic soil. Most of the abaca is grown on the slopes of volcanoes. Some of the volcanoes are active and some are sleeping.

The trade wind. Hawaii, Puerto Rico, and the Virgin Islands are in the latitude where the trade wind blows. The wind blows most of the year from the *northeast* across these islands. In the Southern Hemisphere the same latitudes also have a trade wind, but it blows from the *southeast.*

The trade-wind island climate. This trade wind gives a strange climate to a mountainous island across which it blows. What does Figure 434-A tell you about the amount of rainfall per year in the wettest place on the island? in the driest place on the island (Fig. 434-B)? What do you think the country would look like in the wettest place on that island? in the driest place?

Hawaiian crops. Most of the farm land of Hawaii is on the southwest, or leeward, side of the mountains. This good land is made of the wonderfully rich volcanic soil, and almost every bit that is good for crops has been planted to sugar cane or pineapples. Most of the land on the leeward side has too little rain for good crops, but tunnels have been dug under the mountain tops to bring the water of streams fed by the rain that falls on the windward side. Because tunnels bring water to the dry sides, its plains are almost covered with fields of sugar cane and pineapples. These crops are carefully fertilized with commercial fertilizer (page 295), and no other sugar fields yield so much.

Great fields of pineapples are the second crop of Hawaii, and canned pineapple is the export second in importance. Have you not seen cans of Hawaiian pineapple in a grocery store or in your own home?

Honolulu. Honolulu is a fine large city. It has many beautiful homes and a good harbor. The Hawaiians are great swimmers, and from them we have learned to ride the surf board, a thrilling and difficult sport. Honolulu has a large trade in sugar, pineapples, and the thousand things the people import from the United States and other countries. Look at the world map and see if you can tell why the people call their city the *crossroads of the Pacific.*

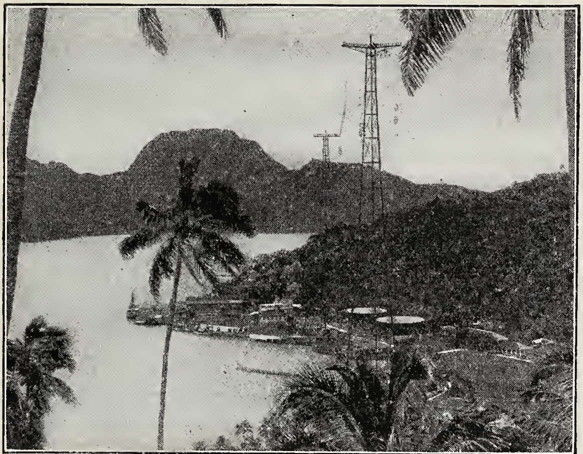


Fig. A. At Pagopago, Tutuila, the United States Navy has this repair and supply station. See the wireless towers and the oil tanks.

Fig. B. An ocean cable.

1. This central copper wire carries the electric current.

2. If it breaks, these flexible copper tapes carry the current around the gap.

3. The "mumetal" wire wrapping whose magnetic qualities keep the telegraph signals from jumbling.

4. A thick covering of gutta-percha holds the currents to their path.

5. A wrapping of jute serves as a cushion against the pressure of three miles of sea water.

6. Eighteen steel armor wires protect the cable from injury.

7. Last of all comes a wrapping of tarred hemp cords, and then the soft ooze of the ocean's floor.

GUAM, SAMOA, AND THE ISLAND GOVERNMENTS

Guam, a naval station. Sailing from Hawaii to the westward, a steamer would come in about two weeks to a little island called Guam. On it are only a few thousand brown men. Our government has a naval station on the island, where coal and other supplies for the ships of our navy are kept.

Guam, a cable station. On the shore at Guam a visitor would find several young white men. They are telegraph operators at the ocean-cable station, or wireless operators at the wireless station. Guam is one of the stops on the cable line that goes from San Francisco to Asia. An ocean cable is a bunch of telegraph wires, bound together in water-tight gutta-percha and laid on the bottom of the sea. Through this copper line, messages are sent from one continent to another in less time than it takes to count two. Someone must be on duty every minute, night and day, at a cable station, to receive and transmit messages. You read cable messages in the newspaper every day.

Guam, a wireless station. On the shore of Guam are the tall towers of a wireless station. It sends messages through the air to the captains of ships at sea. Regularly it sends air messages to Japan and Hawaii. From the naval station at Hawaii the messages are sent to the station at San Francisco (Mare Island), and on to Washington, Newfoundland, Ireland, Norway, Germany, and Russia. Although Guam is only thirty-two miles long, it is a very important little island.

Samoa. The Samoan Islands are in the South Pacific. They, too, are small like Guam. They are of little value except as naval stations, where ships can have repairs made and get coal or fuel oil. The pleasant, friendly brown people who live there are very much like those of our other Pacific islands.

Trade. We have found that each group of islands exports only a few things. The ships that go from the islands take cargoes of sugar, copra, coconut oil, manila hemp, tobacco, and canned pineapples. Most of the ships go back empty, but some carry hundreds and hundreds of packages to

supply the drug stores, hardware stores, and dry-goods stores. When you visit stores in Honolulu, Manila, Iloilo, San Juan, Ponce, or St. Thomas you will find hundreds of things for sale. You could buy safety razors, face powder, all kinds of drugs and medicines, machetes, hoes, wagons, gas engines, electric motors, and automobiles. These are only a few of the many things offered for sale.

Government of our island possessions. Our island possessions have several different kinds of government. Hawaii is a territory. The governor of Hawaii is appointed by the President of the United States. Hawaii has a legislature very much like that of the state in which you live.

In Puerto Rico and the Virgin Islands the governors and certain other high officials are appointed by the President of the United States. The legislature in Puerto Rico is elected by the people; but in the Virgin Islands only a part of the legislature is elected by the people, some members being appointed by the governor.

In Guam the governor is an officer of the United States Navy. The President appoints him to be governor of the island, military commander of the island, and commandant of the naval station. The governor also makes the laws, appoints the police, and has some charge over the courts. Perhaps you will think that he is really a kind of little emperor; but, as far as he can, he allows the people to make most of their own laws, as they had done for hundreds of years before the white men came to their little island.

The government of Samoa is similar to that of Guam.

Philippine independence. In 1934 the United States Government offered to make the Philippine Islands a free nation after a period of ten years. The Filipinos accepted this offer, and in 1935 they made a constitution for the government of the islands. They are now known as the *Commonwealth of the Philippines.* While a commonwealth, the Philippines will be governed by an elected president and elective legislative body. The islands are still more or less closely connected with the United States. In 1945, however, we will sail away and the Philippines will be a foreign country—the *Republic of the Philippines.*

Add to your "To-Be-Continued" map a line to show a trip to Hawaii. In visiting Hawaii, did your route pass through the Panama Canal, or did it start from San Francisco? Let your map show both routes.

A free-hand map for your notebook. Draw a "network" by drawing parallels 18° N., 20° N., and 22° N., and meridians 154° W., 156° W., and 160° W., one inch apart. On this "network" draw the Hawaiian Islands. Color the ocean, the mountains and lowlands, show Mauna Loa, Honolulu, and Oahu.

Some important why's and how's. Tell:

1. Why a volcano explodes;
2. How a volcano causes damage;
3. How volcanoes formed the Hawaiian Islands;
4. How volcanoes help cane and abaca;
5. Why plantation laborers come from Japan; from China; from Portugal; from the Philippines;
6. Why the crops are so big;
7. How American plantation owners make fields produce large crops year after year in land with little rain.

The end. Finish your "To-Be-Continued" map by drawing and measuring your routes to Guam and Samoa. Draw also a blue line to show the cable from San Francisco to Asia.

Working in the colonies. What work is done in a naval station? in a cable station? in a wireless station?

A debate. 1. *Resolved,* That the island possessions of the United States should all be given their independence.

2. *Resolved,* That the Territory of Hawaii should be made a state.

Fig. A. The harbor and part of the city of Montreal, Canada. You are looking eastward down the St. Lawrence River toward the sea.

THE NORTHLANDS

CANADA—DOES A BOUNDARY CHANGE THE LAND?

At the close of the *French and Indian War,* Benjamin Franklin was sent to London to look after interests of the English colonies in America. This war, as you know from your history, was part of the *Seven Years' War* between England and France.

Benjamin Franklin said he had one of the hardest jobs of his life to keep the English from taking the West Indian island of Martinique (Fig. 464-A) instead of taking all of Canada.

As you read this chapter, see if you think Franklin's choice was a wise one.

Does a boundary change the land? Turn to the map, Figure 214-A. Find Mexico City. Pass your finger over the dark brown part of the map from that point northward. Notice that an elevation of 5,000 to 10,000 feet is almost continuous from Mexico City to Valdez, Alaska. What national boundary lines did your finger pass over in tracing this highland? Do the same for the area on the map colored light brown; the area striped brown. What national boundaries did your finger pass over in each case? Does the national boundary between Canada and the United States change the land? Can you say that each region of the United States that touches Canada crosses the boundary and extends into Canada? If the regions are the same as in the United States, why would you expect to find the same occupations and industries on both sides of the United States-Canada border?

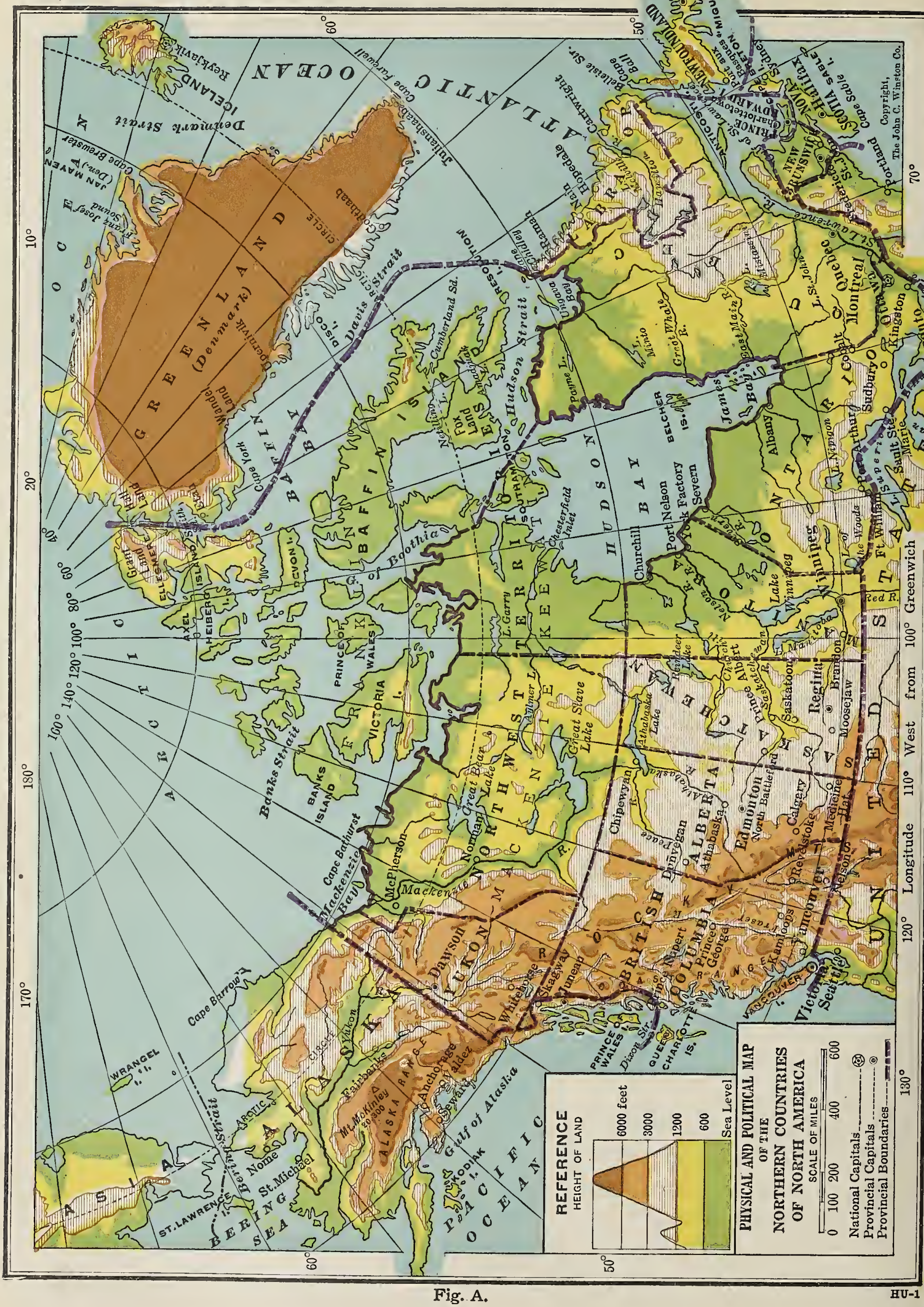
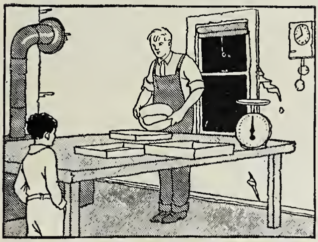

PHYSICAL AND POLITICAL MAP
OF THE
NORTHERN COUNTRIES
OF NORTH AMERICA
SCALE OF MILES
0 100 200 400 600
National Capitals
Provincial Capitals
Provincial Boundaries
REFERENCE
HEIGHT OF LAND
6000 feet
3000
1200
600
Sea Level
Copyright,
The John C. Winston Co.
Longitude West from Greenwich
GREENLAND
(Denmark)
ARCTIC OCEAN
ATLANTIC OCEAN
PACIFIC OCEAN
HUDSON BAY
BAFFIN BAY
BAFFIN ISLAND
ALASKA
YUKON
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
QUEBEC
LABRADOR
NEWFOUNDLAND
NOVA SCOTIA
NEW BRUNSWICK
UNITED STATES
ICELAND
BERING SEA
Hudson Strait
Davis Strait
Denmark Strait
Bering Strait
Banks Strait
Gulf of Alaska
Winnipeg
Montreal
Quebec
Toronto
Ottawa
Edmonton
Calgary
Regina
Vancouver
Victoria
Dawson
Fairbanks
Nome

Fig. A.

1. Tapping the trees.

2. The gathering tanks (on the bobsled).

3. The lean-to.



4. Sugaring off (pouring into greased tins).

5. The sugarhouse.

6. The open-air sap boiler.

Fig. A. These six drawings show the old-style process of gathering and making maple sirup and maple sugar.

FARM LIFE IN EASTERN CANADA

Maritime Canada. The part of Canada between Maine and the Gulf of St. Lawrence is sometimes called Maritime Canada because it is near the sea. This land is very much like New England, except that it does not have so many cities. Most of its people are farmers.

Scott McDonald's farm. Scott McDonald lives on his father's farm in the province of New Brunswick, east of Maine, where winter lasts for almost half the year. Scott and his friends enjoy plenty of coasting, skating, and skiing.

In a single season, Scott often catches twenty-five muskrats along the stream that runs through the farm. Sometimes he finds a skunk or even a mink in his trap. Then he is lucky indeed, for the pelts, or skins, are worth several dollars each.

The sugar-maple crop. For three weeks in March, Scott is very busy in his father's sugar-maple grove helping with the sugar harvest. The Indian taught the white man how to make maple sugar from the sap of the sugar-maple tree. Before the snow is gone in early spring, sap begins to pass from the roots to the top of the tree. Then Scott bores holes in the trunks of the trees. He puts little pipes into the holes, and the sap runs out through the pipes into buckets.

The sap is boiled in a kettle or pan over a wood fire, until most of the water has gone off as steam and only a thick, sweet sirup is left. Sometimes maple sirup is sent to market; sometimes the sirup is boiled a little more, so that when cool it hardens into cakes of maple sugar.

In land too rough for the plow, sugar-maple trees can grow. A great deal of this rough land is found in our Northeastern States, and in the southeastern part of Canada. Without the money they get from sugar, many farmers would have to go out of business.

There are abandoned farms in eastern Canada, just as in New England (page 391) and for the same reasons.

Fig. A. A fox farm. See the picture of the fox against the snow. The pens are at the right and the left.

Prince Edward Island. In two parts of Maritime Canada farming has held on better than in most of the region. The little province called Prince Edward Island is not like its neighbors. It is built on soft sandstone. The frost and the other forces of nature break up the sandstone into fertile soil that is much easier to cultivate than is most of the land in the New England–Canadian Maritime Region. The cool summer suits oats, grass, potatoes, especially potatoes. The Prince Edward Islanders grow about 75 bushels of potatoes for every man, woman, and child.

Fox farming. The people also get some money from fox farming. The Arctic fox is white, but once in a while there is a black one, and black fox fur brings a higher price. Years ago a man in Prince Edward Island caught a few black foxes and raised their pups. Today there are hundreds of fox farms, not only on Prince Edward Island, but in every other Canadian province, and in nearly half of the states of the United States.

Nova Scotia: apples and woods. The second good farming center of eastern Canada is in the narrow Annapolis-Cornwallis Valley of Nova Scotia. It has the same kind of soil as Prince Edward Island and Aroostook County, Maine, and is dotted throughout with apple orchards. In some places the orchards join one another for miles. In the autumn, tens of thousands of barrels of apples are carried by railroad to Halifax, and there put into ships for Europe.

Giving reasons. Complete the following sentences by giving the reasons: 1. Farming is difficult in New Brunswick because

2. Maple trees are valued in Maritime Canada because

3. Prince Edward Island has good farms because

4. Nova Scotia has some good farms because

Answer in threes. 1. Name three parts of Maritime Canada.

2. Name three farm products of Maritime Canada.

3. Name three fur-bearing animals of Maritime Canada.

4. Name three winter sports of Maritime Canada.

Telling a story from pictures. Using Figure 449-A, tell the story of maple sugar.

A "To-Be-Continued" map. On an outline map of the Northlands, show the Maritime Region of Canada. Save this map in your notebook, and add the other regions.

Fig. A. In this picture you are looking across the St. Lawrence River at the city of Quebec. See the high bluffs on which much of the city is built.

FARMERS OF THE ST. LAWRENCE VALLEY AND THE LAKE REGION

Butter and cheese. Scott McDonald's cousin Alfred lives on a farm in the St. Lawrence valley, near Montreal. Morning and afternoon Alfred helps to milk the cows. The milk is taken to a creamery, where some of it is made into cheese and some into butter. The creamery is owned by all the farmers together (*coöperative creamery*). Thus all farmers do together what none could do alone.

Canada has several thousand coöperative creameries and cheese factories. Many creameries are needed because nearly all the farmers in this section keep cows, and for the same reasons that you read about on page 369.

French Canada. Quebec may be considered a French province. Most of the people living in the section from Montreal to the mouth of the St. Lawrence are descendants of the French settlers. Many of them speak only the French language. Quebec, the capital of the province, is a beautiful, quaint old city. In Quebec, farms are not being abandoned, for the people have large families and few emigrate. Instead, the people are cutting down the forest and making new farms. The farms are needed for the sons and daughters when they grow up and marry.

The lakes and fruit. The Canadian lowland lying between Lake Ontario, Lake Erie, and southern Lake Huron is much like the near-by parts of the United States. You learned about the lake-shore fruit industry in the United States (page 370). If you visited the orchards of apples, peaches, pears, and the vineyards of grapes you would be unable to tell whether you were on the south shore of Lake Ontario in New York, or the south shore of Lake Erie in New York or Ohio, or the north shore of Lake Erie in Ontario. Much fine fruit from this section goes every year to the cities of Canada and by ship to Europe.

Add to your "To-Be-Continued" map. Add the St. Lawrence Valley and Great Lake Region of Canada.

Twin Lists. Draw two columns. In one, list our states that lie in the St. Lawrence valley and that border the Great Lakes; in the other, list the provinces of Canada that lie along the St. Lawrence and along the Great Lakes. Why are these twin lists?

Do you remember? Why do our North Central States' farmers keep cows? Why do they raise fruit trees? Repeat these reasons for the St. Lawrence valley and Great Lakes region of Canada.

Some questions that make you think.
1. Why are there French-speaking people in Canada?
2. Why do the dairymen sell cheese and butter rather than milk?
3. Why is the fruit shipped to Europe rather than to the United States?
4. From what seaports is the fruit shipped?
5. From the population map (Fig. 457-A), tell where most of the people of the Northlands live.

Fig. A. Threshing wheat in the Canadian province of Saskatchewan.

FARMS AND TOWNS IN THE PRAIRIE PROVINCES

Giving away farms. The Canadian government gave Scott McDonald's Uncle Andrew a farm. It is in the province of Alberta, not far from the city of Edmonton. The land is a part of that great level, rich plain that we found when studying the spring-wheat region of the North Central States (page 365). Does the map, Figure 448-A, tell you what states and provinces are in this region? Quickly draw on blackboard or paper all the provinces of Canada that touch the northern boundary of the United States.

For many years the Canadian government gave farms of 160 acres to anyone who would go to live upon them.

Railroads were built in a hurry from Duluth and Fort William on Lake Superior to Winnipeg and on across the plains to the Rocky Mountains. Sketch these railroads on the map you have just made. Explain why railroads could be quickly and easily built here. Farmers now came by thousands from eastern Canada, from the United States, and from Europe. Soon tall grain elevators stood beside hundreds of railway stations, and thousands and millions of bushels of wheat and oats and flaxseed were shipped to the Great Lakes to be carried on to Buffalo by boats, or on to Montreal and down the St. Lawrence by ocean steamer.

Like the United States. If you should travel along the roads in this wheat country, you could not tell by looking whether you were in Minnesota, Dakota, or one of the Prairie Provinces of Canada. The people look the same; the houses, barns, cattle, and crops look the same; and the crops are tended by the same kinds of machinery. Some of the farmers are putting up silos and keeping herds of cows, and shipping butter and cheese to eastern cities, just as farmers do in the United States parts of this region.

There is one thing you would miss. You would not see wide fields of corn. The summer is too short and cool for this crop. But the climate suits spring wheat, oats, barley, rye, potatoes, and flaxseed. Some of the farmers have begun to grow fields of sunflower plants. These are chopped up, stalks and all, and are put into the silo for cow feed. It is really

Fig. A. The city of Winnipeg, Canada, as seen from the air. Winnipeg is the capital of the province of Manitoba. The large building in the center of the picture is the Parliament Building.

wonderful to have discovered a way to make good cow feed from sunflower plants.

Northeast of this spring wheat region in Canada is the Great North Woods about which you will read on page 454. Between the spring wheat region and the mountains are the Great Plains—grass lands with cold winters. In this part of the plains little grain is grown, and most of the people keep herds of cattle, horses, and sheep.

The cities of the plain. When you studied about the central part of the United States, you found that it had one great trading city, Chicago, and several smaller ones to the west of it on the plains. Canada is like the United States in this way, too. It has Winnipeg — the great railroad center and trading city — the *Chicago of Canada.* Look at the map and see whether it tells you why Winnipeg became a great railroad center, and why all the railroads that cross Canada pass through it.

To the west of Winnipeg are smaller trade centers: Regina, Edmonton, Calgary. Put these on your map also. To know what the people in these cities do for a living, you may read again about Chicago, St. Louis, Kansas City, Omaha, Minneapolis, and St. Paul, and remember one difference: there is not *so much manufacturing* in the Canadian cities. Through the freight yards of the Canadian cities passes Canada's greatest export — wheat, hundreds of millions of bushels of wheat.

The future of the Prairie Provinces. If we should need greater quantities of food in North America, the spring wheat region of Canada could give us much more than it now does. Some day these provinces may have great manufactures.

A "Match Me" game. Divide the class into two teams. The challenging team says, "Minnesota raises spring wheat," or "Wheat starts down the lakes from Duluth," etc. A pupil from the opposite team must match this statement with one about Canada. The second team scores five points for each statement that it can match. When every pupil in the second team has been challenged, the second team becomes the challengers.

Add to your "To-Be-Continued" map. Add the Prairie Provinces of Canada, divided into the spring wheat region and the ranch region.

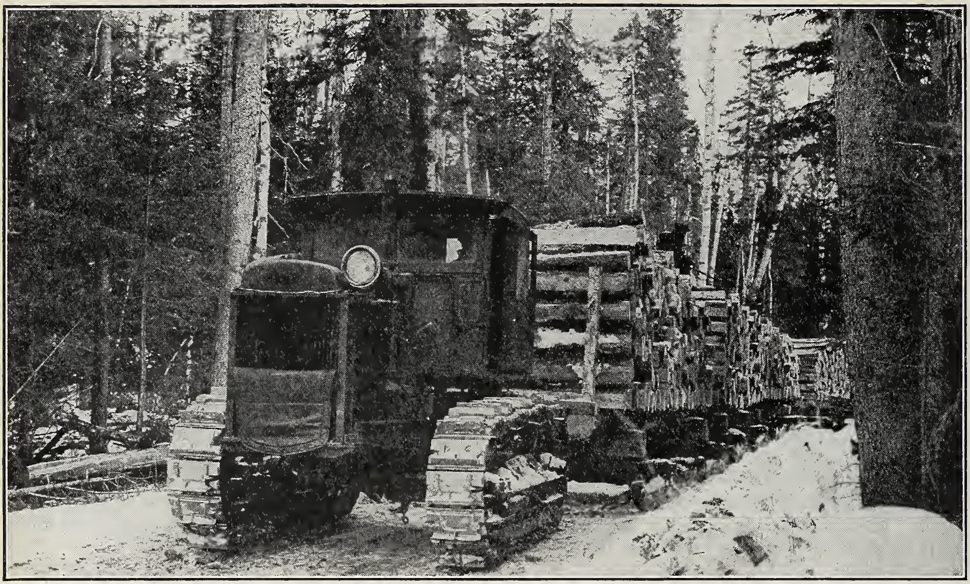


Fig. A. In the Great North Woods. Canada has two great problems: to get wood; and to save the forest.

THE GREAT NORTHERN FOREST

Land of great forests. The Great Northern Forest of Canada, like its partner, the *Taiga*, or Great Northern Forest of Eurasia, is a land of rocks, lakes, waterfalls, and evergreen trees—a land of great spaces and few people. Farming is impossible in most of this land, even if the climate were suitable. In the part of it east of the prairies, the glacier seems to have done its worst by scraping off much of the good earth and by spreading rocks over the rest. Only trees can grow here, and in some places the rock is so bare that even trees cannot find a place.

Lumber and paper. What is the elevation of the part of this forest region near the St. Lawrence Valley (Fig. 448-A)? The streams flowing down from this plateau to the St. Lawrence are used to carry logs and pulp wood in the season of spring freshets, as do the streams of New England. Ottawa, the capital of Canada, is sometimes called a *sawmill town,* and sawmills and paper mills are scattered by the score along the southern edges of this forest region. Lumber and its products, pulp and paper, are second only to wheat as the chief export of Canada.

Furs and hunters. Since the days of the earliest settlements, Indian hunters have caught wild animals and sent valuable furs to Europe. Trading posts (little stores) are scattered along the rivers at all the entrances to this forest land. In spring the hunters take their furs to the post and exchange them for money and supplies.

Add to your "To-Be-Continued" map. Add the Great Forest region of Canada.

I'll give you a start. Answer these questions about the Great Northern Forest region. 1. Why are there no farms?

2. Why do the railroads take to the coast more than they bring in?

3. Why is spring season the Indian's time for trading furs?

4. Why is lumbering important?

5. How did the glacier both help and hurt the region?

POWER, MANUFACTURING, MINING, AND THE ATLANTIC PORTS

Water power. Since man learned how to turn waterfalls into electric power and how to carry it a hundred miles or more, the Laurentian Plateau has become a great power resource. The glaciers made hundreds of lakes on the top of the Laurentian Plateau. Lakes are splendid natural reservoirs.

This electric power is used to grind into pulp the logs of the Great Northern Forest; to smelt aluminum ores in the great heat of electric furnaces; to run the factories, street cars, and lights in Quebec, Montreal, Toronto, and many other Canadian cities. Power lines seem to be everywhere, and thousands of Canadian farmhouses and barns have electric light and power in them. Canada shares with the United States the water power of Niagara Falls.

The Canadian lowland between Detroit and Quebec is much like the part of the United States across the lake. It is the chief manufacturing region of Canada. It has many factories, and scores of them are branch factories of American companies. In the factories are made automobiles, farm machinery, and many other things to supply the Canadian market and foreign countries.

Toronto and the canals. The Canadians have enlarged the Welland Canal. This canal allows boats to pass between Lakes Erie and Ontario. Other canals allow the boats to pass the rapids in the St. Lawrence, to meet the ocean steamers in the harbor of Montreal.

Nickel and silver. Nickel was found at Sudbury, Ontario, by men who were building a railroad. Now Canada mines more nickel than any other country. One of the mines has enough ore to supply the world for years. Silver was found in the same way near Cobalt, Ontario, and now Canada is also an important producer of silver.

Coal and iron. There is no coal in the part of Canada drained by the St. Lawrence, but Canada's next-door neighbor has plenty of coal in the coal fields of Pennsylvania. Every year thousands of carloads and hundreds of boatloads of coal go from the United States across the Canadian boundary.

Canada's two coal fields are hundreds of miles from the valley of the St. Lawrence. One is on Cape Breton Island, Nova Scotia. Here iron furnaces use coal and the ore that comes by boat from Newfoundland; paper is made from the wood of the Maritime Provinces; and there is some manufacturing of cotton, wool, and other things.

Also, millions of tons of coal lie under the soil of the Prairie Provinces. This is one of the greatest coal fields of the world, but the coal is not so good as that of Cape Breton or Pennsylvania.

The Atlantic ports. Every summer millions of dollars' worth of freight from Chicago and other lake ports goes to the ships in the harbor of Montreal for shipment to foreign countries. In winter, when the St. Lawrence is hard with ice, thousands of freight cars loaded with Canadian produce go to the ships at New York, Boston, or Portland, Maine. There is also a great increase in the shipments from St. John, N. B., and Halifax, which has a splendid harbor and is the eastern terminus of the great Canadian Pacific Railway.

Power ideas. Use these expressions in sentences about the Laurentian Plateau: Electric power, power resource, power lines, water power, power and light, natural reservoirs.

An exercise for sharp eyes. Make a list of six kinds of work that electric power can do. Check your list by reading carefully the second paragraph in this section.


PHYSICAL AND POLITICAL MAP OF ALASKA
SCALE OF MILES
0 50 100 150 200 250 300
Territorial Capitals
Provincial Boundaries
International Boundary
Steamship Lines
REFERENCE
HEIGHT OF LAND
10000 feet
5000 "
2000 "
1000 "
500 "
Sea Level
ARCTIC OCEAN
BERING SEA
GULF OF ALASKA
PACIFIC OCEAN
DOMINION OF CANADA
ASIA
SIBERIA
ALEUTIAN ISLANDS
Same scale as main map
Copyright, The John C. Winston Co.
Longitude West from Greenwich

Fig. A.

HU-1

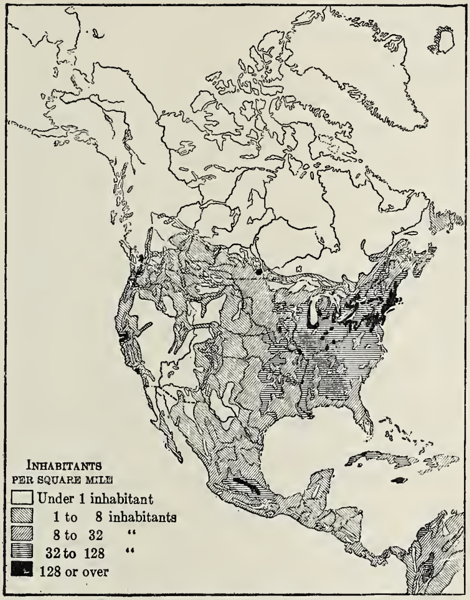


Fig. A. Distribution of the population in North America

Fig. B. Annual average rainfall in North America.

CANADA'S WESTERN MOUNTAINS AND PACIFIC COAST

The map (Fig. 448-A) shows many mountains in western Canada. These mountains are high, and their valleys are so narrow that even in 1936 an automobile had to pass through the United States to get from Edmonton to Vancouver.

Western Washington and British Columbia have a climate much like that of England. They have a cool, moist summer, and the winters are not very cold. This climate is splendid for man. It is too bad that the mountain wall goes so close to the sea that Canada has only a little land with this good climate. Small areas near Vancouver and Victoria have dairy farms and berry farms, much like those near Seattle. Tell why British Columbia leads all the Canadian provinces in lumber (page 340). The Canadian land between the Pacific Ocean and the plains east of the Rockies is much like that on the American side of the boundary. Where irrigation is possible, splendid crops of apples and grain are grown in the Fraser River Basin.

The city of Vancouver is the western port to which the Canadian Pacific Railway carries its produce. The other Canadian transcontinental railroad system carries western grain to Prince Rupert, a new town nestled on a small plain on a coast that is high, rocky, and full of deep bays.

Add to your "To-Be-Continued" map. Add the Western Mountains and Pacific Coast region of Canada.

Alike again. On the map above, put dots and initials for Vancouver and Prince Rupert. In the ocean draw a line to show the current that flows past the doors of two countries. Draw an arrow from the west to show the winds that blow over both countries. Is our western coast better than Canada's?

Making lists. Copy and fill in the chart:

Province	Capital	Chief Product

ALASKA AND THE YUKON TERRITORY

The gold rush. The port of Juneau, Alaska, is on one of the deep bays that run back into the mountains and seem almost like rivers. In the autumn of 1897, Juneau was thronged with young men from the United States, Canada, and many other countries because news had come that someone had found gold in the Upper Yukon. The young men went over the mountains into the cold interior, seeking gold in a strange, empty land.

Many men died in the first winter. Some froze to death. Some died of disease. Some starved. It is said that the first dog-sled load of potatoes that came in the spring sold for their weight in gold.

The first gold was secured by panning. Then came placer mining, but this was not followed by finding the mother lode (page 316) and so some miners had to move away.

Alaska Is Separated into Three Parts

1. The central and upper Yukon — the forested interior. At present, most of the Yukon valley is only a scrubby forest, with stretches of grass land covered deep with snow for much of the year. It is the home of caribou, deer, moose, wolf, bear, and Arctic rabbit. In the future, if America needs more food, there may be many farms in the Yukon valley. We know that this is possible because the United States Government has an agricultural experiment station near Fairbanks, and Canada has one near Dawson, and in both places some surprisingly good crops are grown.

In the short summer the sun shines for eighteen or even twenty-two hours a day. So much light makes crops grow rapidly. Pea vines grow almost like the bean plant of "Jack and the Bean Stalk." Lettuce, cabbage, turnips, and some other vegetables do well, and fine crops of oats and barley can be grown in some years.

2. The forested coast and some islands. From Kodiak Island southward, the Alaska coast has fine forests near the sea, and some large paper mills run by water power have already been built. With care, these forests on the damp, rainy coast should give a perpetual supply of wood. Along this coast is the great industry of the summer — canning salmon. Read the story again (page 345).

3. The tundra — home of Eskimo and reindeer. From Kodiak Island westward and northwestward the sea water is too cold to let trees grow, but many kinds of grass, small bushes, and moss grow well. Such land is called tundra. Alaska has 200,000 square miles of tundra facing the Bering Sea and the Arctic Ocean. This is the homeland of the Eskimo.

When the white man and his rifle came to this land, there was enough game to supply the Indian and the Eskimo. The white man killed so many animals that the Indian and the Eskimo began to starve. Then the American government brought tame reindeer from Lapland and Siberia; they brought reindeer herders, who taught the Alaskan people how to take care of reindeer. In forty years the herds have increased from a few hundred to nearly a million.

The reindeer does not need to have food put up for him in barns. He is at home in the tundra. With his long, strong hoofs he digs through the snow to get the moss that lies beneath it, just as do his wild brothers, the caribou. Caribou run wild from the Bering Sea to the banks of the St. Lawrence, and even in the forests of Newfoundland. Reindeer herders may some day tend their flocks in all the wide tundra region of North America.

The fur industry of the coast and islands. The fur of foxes is an important export of Alaska. Several hundred fox farms are on the Alaska peninsula and the Aleutian Islands. The foxes are fed on fish which are plentiful and are easily caught.

The fur seal. A herd of about 900,000 seals comes up out of the sea to live for a few weeks each summer on the Pribilof Islands in the Bering Sea. Here the baby seals are born. In a few weeks, when the young are strong enough to swim about by themselves, they go away with the old seals to live and catch fish in the sea.

When the seals are on the shore with their young, they may be easily caught. Men from many countries went to catch seals for their valuable skins, and killed almost all of the fur seals. Now the seals are protected by the United States government and other governments, and only 40,000 a year may be killed. This allows the herd to increase.

New settlements. In 1935 the United States Government sent two hundred families from run-down farms in Minnesota, Wisconsin, and Michigan to settle on forty-acre farms in the rich Matanuska Valley near Anchorage, Alaska. Here these farmers plan to grow crops for their own use and to sell vegetables and milk to non-farmers already in Alaska.

THE GOVERNMENTS OF ALASKA AND CANADA

Alaska is a territory of the United States. It has a legislature to make laws, just as our states have, but the President of the United States appoints the governor for Alaska.

The government of Canada. Canada has nine provinces, which are like our states, and four territories. Canada has a Parliament much like the Congress of the United States. We have a president whose work is to see that the laws are carried out; in Canada they elect a premier. Canada also has another official of government—a governor-general. This official is appointed by the King of England. He lives in Ottawa (Fig. 448-A), the capital of the Dominion of Canada, and he is said to be the head of government of Canada, but he has almost no power. The governor-general lays corner stones of buildings, opens expositions, makes speeches at dinners, does all that he can do to keep the people of Canada and the people of England liking each other. Canada is one of many countries that make up the British Empire.

Fig. A. Seals on the shore of a Pribilof Island, Bering Sea.

Add to your "To-Be-Continued" map. Add the three regions of Alaska. Show how these regions extend into Canada.

Sentences to write. Write sentences using each of the following words:

Alaska	salmon	Eskimo
summer day	tundra	experiment
Yukon	fur farming	station
Kodiak	fur seal	gold rush

Some interesting why's. 1. Why do plants grow quickly along the Yukon?

2. Why are there no farms along the Pacific? along Bering Sea and the Arctic?

3. Why are caribou and reindeer the only animals that can be raised by the Eskimos?

4. Why did several governments make a treaty about seals?

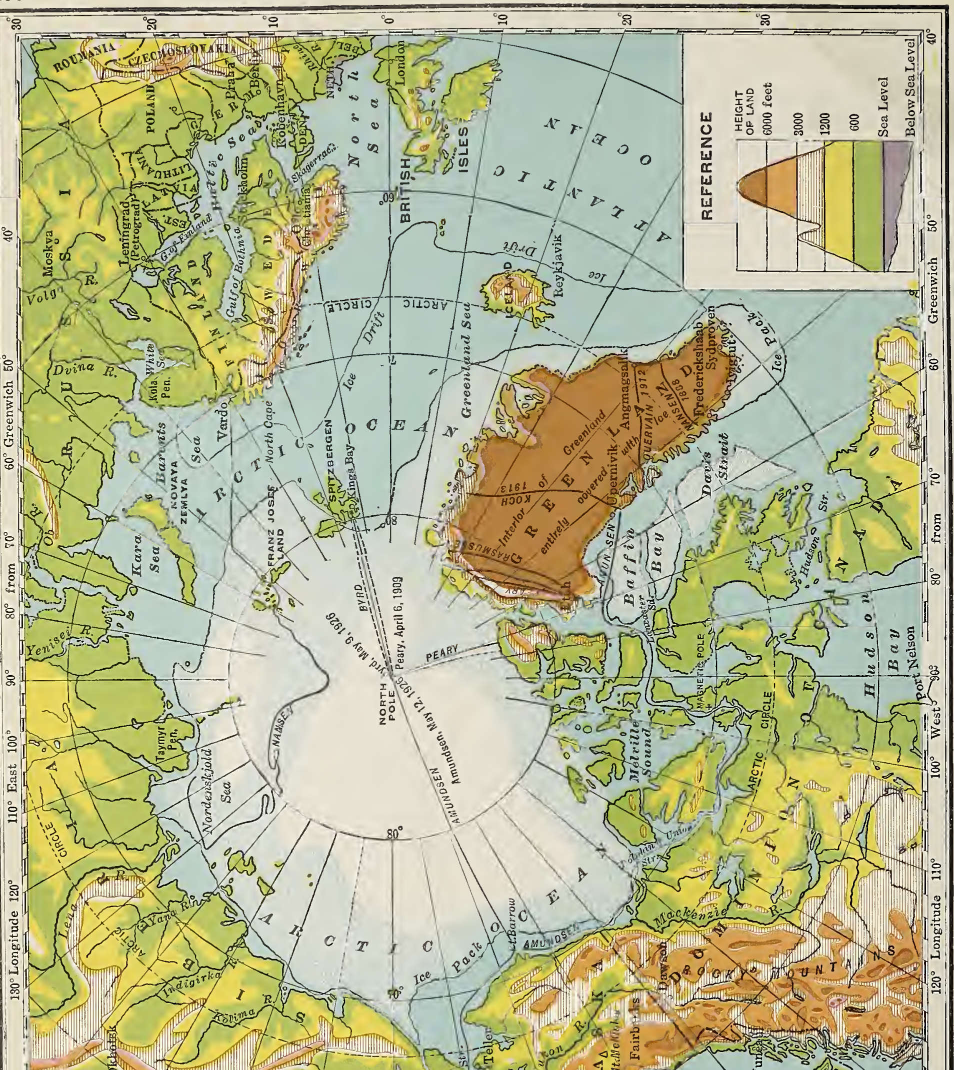

PHYSICAL MAP OF
NORTH POLAR
REGION
SCALE OF MILES
200 400 600 800
REFERENCE
HEIGHT OF LAND
6000 feet
3000
1200
600
Sea Level
Below Sea Level
ARCTIC OCEAN
ATLANTIC OCEAN
PACIFIC OCEAN
NORTH POLE
Peary, April 6, 1909
Byrd, May 9, 1926
Amundsen, May 12, 1926
GREENLAND
Interior of Greenland entirely covered with ice
Bering Sea
Sea of Okhotsk
Hudson Bay
Baffin Bay
Davis Strait
Greenland Sea
Barents Sea
Kara Sea
Nordenskjold Sea
North Sea
ICELAND
SPITZBERGEN
FRANZ JOSEF LAND
NOVAYA ZEMLYA
BRITISH ISLES
ALASKA
CANADA
SIBERIA
ROCKY MOUNTAINS
ALEUTIAN ISLANDS
ARCTIC CIRCLE
MAGNETIC POLE
Ice Drift
Ice Pack
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Fig. A.

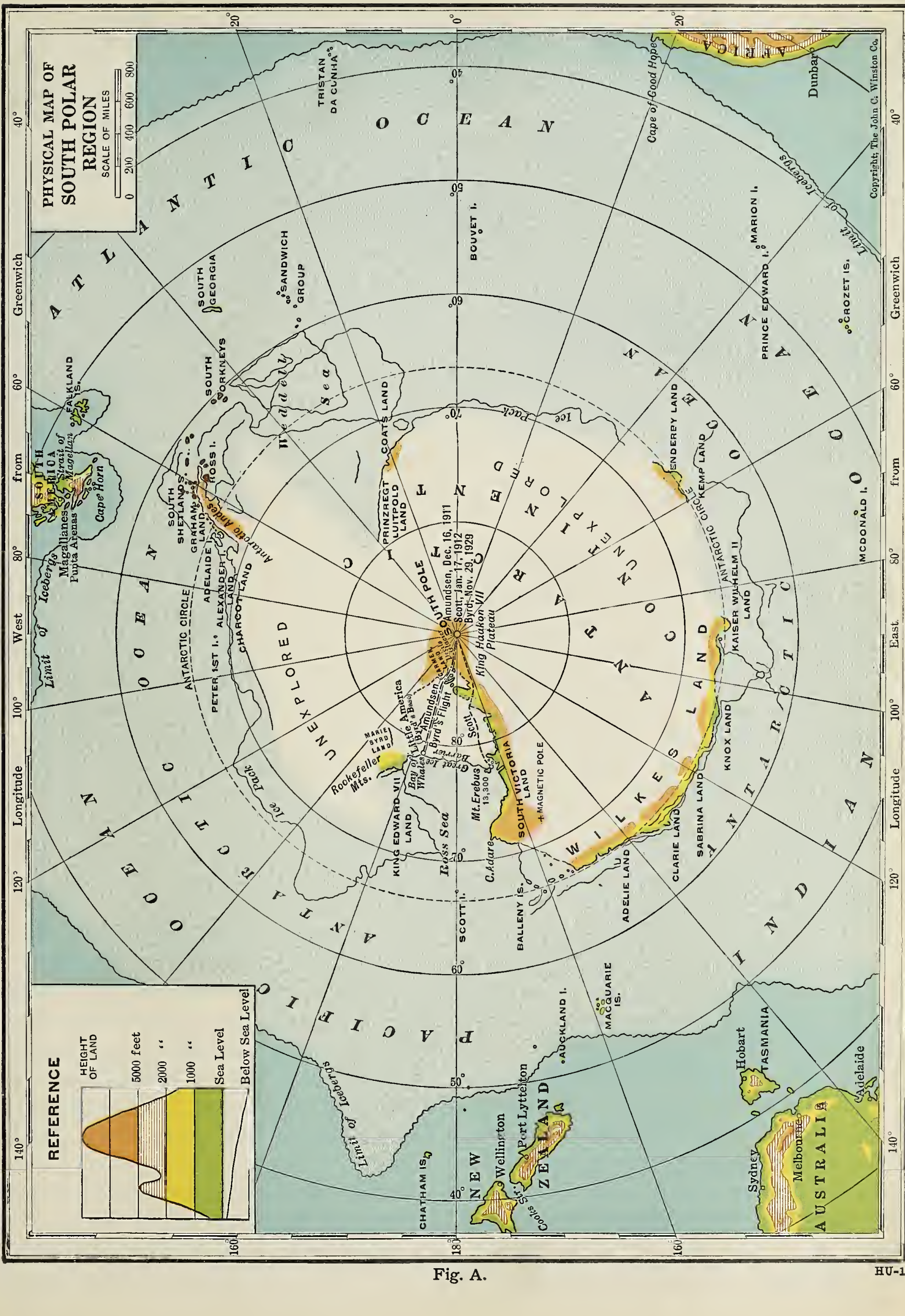
PHYSICAL MAP OF SOUTH POLAR REGION
SCALE OF MILES
0 200 400 600 800
REFERENCE
HEIGHT OF LAND
5000 feet
2000 "
1000 "
Sea Level
Below Sea Level
ATLANTIC OCEAN
ANTARCTIC OCEAN
PACIFIC OCEAN
INDIAN OCEAN
ANTARCTIC CONTINENT
UNEXPLORED
UNEXPLORED
WILKES LAND
SOUTH POLE
Amundsen, Dec. 16, 1911
Scott, Jan. 17, 1912
Byrd, Nov. 29, 1929
King Haakon VII Plateau
Weddell Sea
Ross Sea
Great Ice Barrier
Bay of Whales
Little America
Rockefeller Mts.
MARIE BYRD LAND
KING EDWARD VII LAND
SOUTH VICTORIA LAND
Mt. Erebus 13,300
C. Adare
MAGNETIC POLE
ADELIE LAND
CLARIE LAND
SABRINA LAND
KNOX LAND
KAISER WILHELM II LAND
KEMP LAND
ENDEREY LAND
COATS LAND
PRINZREGT LUITPOLD LAND
GRAHAM LAND
ADELAIDE I.
ALEXANDER I. LAND
CHARCOT LAND
PETER 1ST I.
SOUTH SHETLANDS
SOUTH ORKNEYS
SOUTH GEORGIA
SANDWICH GROUP
ROSS I.
FALKLAND IS.
SOUTH AMERICA
Strait of Magellan
Magallanes
Punta Arenas
Cape Horn
Antarctic Andes
ANTARCTIC CIRCLE
Ice Pack
TRISTAN DA CUNHA
BOUVET I.
MARION I.
PRINCE EDWARD I.
CROZET IS.
McDONALD I.
Cape of Good Hope
AFRICA
Dunbar
Limit of Icebergs
SCOTT I.
BALLENY IS.
MACQUARIE IS.
AUCKLAND I.
CHATHAM IS.
NEW ZEALAND
Wellington
Port Lyttelton
Cook Str.
TASMANIA
Hobart
AUSTRALIA
Adelaide
Melbourne
Sydney
Longitude West from Greenwich
Longitude East from Greenwich
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Fig. A.

HU-1

Fig. A. The town which you see in this picture is St. Anthony, in the northern part of Newfoundland. The large building is the Grenfell Hospital. What can you find out about the work of Dr. Grenfell?

NEWFOUNDLAND AND LABRADOR, GREENLAND AND ICELAND

Newfoundland, a British colony about the size of the state of Pennsylvania or Tennessee, has only 270,000 people and is entirely independent of Canada. It has a legislature much like Canada. It has its own governor, who is sent out from England. Newfoundland also governs Labrador.

A cold current creeps along the coast of Labrador, carrying ice water and icebergs from the shores of Greenland. Most of Greenland is a high plateau, covered by a glacier like the one which once rode over so much of North America (page 354). The icy current makes Newfoundland and Labrador so cold that trees and crops cannot be grown on the shore. The ancient glacier also made the surface rough, and farming is difficult. Only such crops as hay, turnips, carrots, and a few potatoes can be grown. The people of Newfoundland import from Canada and the United States almost everything they eat. They have three main exports, and with the money they obtain from exports they buy food.

Fish. Cold water seems to suit fish as well as warm water. You may be surprised to learn that cold water produces more fish food than does warm water. In summer, thousands of fishermen leave Newfoundland and sail north along the coast of Labrador to catch codfish. Sometimes they build shacks along the harbors of Labrador, and there spend part of the summer catching and drying codfish. When autumn comes, most of them go back to their homes in Newfoundland.

Only 4000 people live in Labrador, although it is nearly twice as large as the New England States. In most places along the coast, summer is so cold that vegetables can be raised only by covering them with canvas to keep frost away. The winter is just one blizzard after another.

Seals. In early spring the Newfoundlanders catch thousands of seals. The skins are valuable for making leather and the fat is used to make oil. Fish products

and seal products are the chief export of Newfoundland and Labrador.

Paper. The second export is pulp and paper. The interior of Newfoundland is almost exactly like the highlands of the Northeastern States and Canada. The rocky land has many swamps, lakes, rivers, and a covering of evergreen forest. There is plenty of water power to grind the wood.

Iron ore. The third export is iron ore, which goes to Canada and the United States.

Greenland, a colony that is protected. About 14,000 Eskimos live on the great island of Greenland, under the protection of the Danish government. Less than three hundred Danish people live in Greenland, but they have schools and missions and are helping the Eskimo to catch, can, and sell fish and to start new businesses. You would not be allowed to visit Greenland unless you had a landing permit from the Danish government. You could not even give your cap or a pair of mittens to an Eskimo without permission. This is because Denmark is trying to protect the inhabitants from disease. The Eskimos are getting along very well and are increasing in number.

The people live in a narrow strip of land along the shore in the southeastern part of Greenland. Most of that very large island is covered hundreds of feet deep with clear blue ice with a blanket of snow on top. Here and there near the edge, some rocky peaks stick up above the snow.

Iceland. A thousand years ago there was a war in Norway. Afterwards many of the best people, not liking the government, went to live in Iceland. In Iceland the people read many books. You may see a girl riding on a pony with two cans of milk or cream balanced across the saddle, and reading as she goes to the creamery.

Her father may read English, French, and German books for pleasure. There are only about 100,000 inhabitants. But you could not go to Iceland to live if you wanted to do so because this independent little nation wants to keep its life and customs unchanged.

The island was made by volcanoes. Four fifths of its surface is bare lava or wide glaciers. The climate is too cold for trees, and only a very few crops, such as potatoes and turnips, can be grown. Grass grows well, and hay is the chief crop of the island. Hay is needed to feed the horses, cows, and sheep.

Trade. For a long time Iceland has exported wool, sheepskins, some cattle and horses, and eiderdown (feathers which are found in the nests of wild ducks). The chief export, however, is codfish.

There are many lakes and many waterfalls, and, now that the age of machinery has come, the people of Iceland are planning to develop water power and to have factories.

Add to your "To-Be-Continued" map. Add the cold current that flows between Greenland and Labrador.

A question for debate. Is ice cruel or kind to Labrador and Newfoundland? If you think it is kind, you will have to take the side of the fisherman, the sealer, and the paper maker. If you think it is cruel, talk about the hardships of farming.

Some puzzling why's. Explain these questions about Labrador and Newfoundland:

a. Why are there trees in the interior, but none along the coast?
b. Why are most of the people fishermen?
c. Why are there few inhabitants?
d. Why must the people buy almost all their food?
e. Why may they some day become important?
f. Why do they not smelt their iron ore?
g. How can the people get jobs and make money from the sea? from the forest? from the land?

Do their names fit? Is "Iceland" a better name for Greenland? Explain.

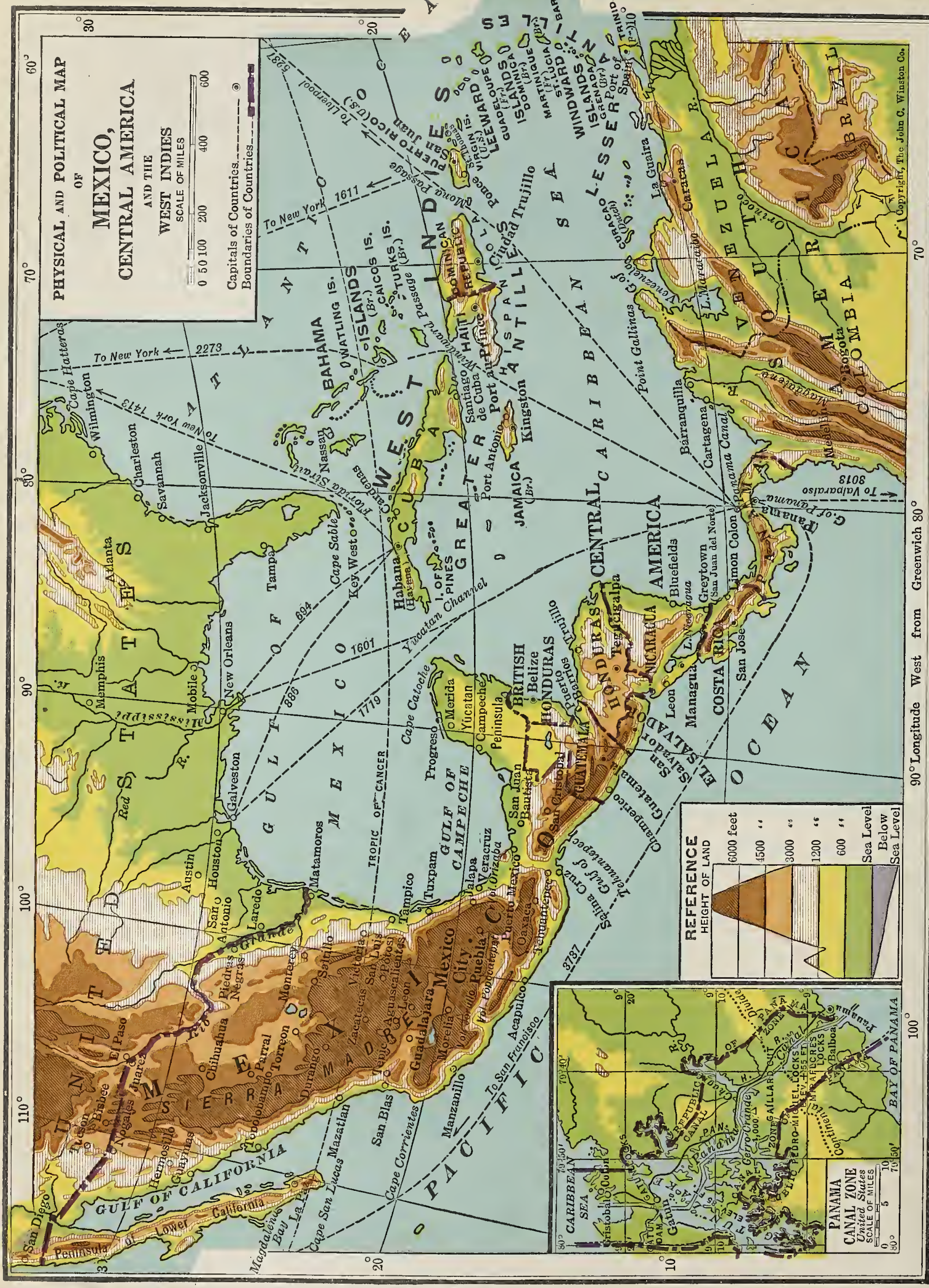
PHYSICAL AND POLITICAL MAP OF
MEXICO,
CENTRAL AMERICA
AND THE
WEST INDIES
SCALE OF MILES
0 50 100 200 400 600
Capitals of Countries
Boundaries of Countries
REFERENCE
HEIGHT OF LAND
6000 feet
4500
3000
1200
600
Sea Level
Below Sea Level
PANAMA CANAL ZONE
United States
SCALE OF MILES
90° Longitude West from Greenwich 80°
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Fig. A

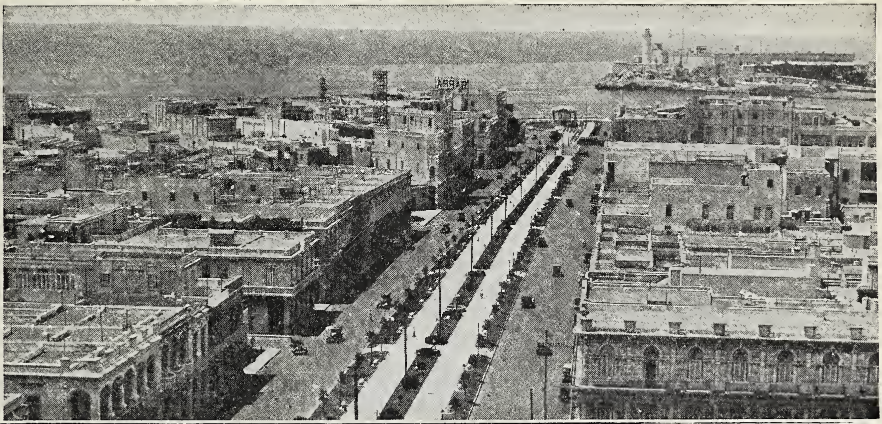

Fig. A. The Prado, Havana, looking toward Morro Castle. This castle in the distance is the fort which has guarded the harbor of Havana since the days of slave ships and pirates. Havana is becoming a popular winter resort for people from the frosty lands of the United States and Canada.

THE SOUTHLANDS

THE WEST INDIES, MEXICO, AND CENTRAL AMERICA

WHAT ARE THE SOUTHLANDS LIKE?

You remember that in the Corn Belt one can go for great distances and find the country and the people everywhere the same. As you read about the southern countries of North America (Fig. 464-A), try to answer these questions: Are they lands of variety, and, if so, why? In how many ways do they show variety? You will need to use your map almost every moment as you study this chapter.

Many countries. Make a list of the names of the countries between the southern boundary of the United States and South America. Add the names of four large West Indian islands to your list. Which island has a boundary line across the center? See under the word Jamaica the small letters "Br." that mean "British." What countries have colonies in the West Indian islands?

Lands of up-and-down. The southern countries have great variety in surface. Look carefully at the colors on the map (Fig. 464-A) and tell the elevation of the highest part of Cuba; of Panama; of Guatemala; of Mexico. These highlands have many, many mountains. These lands are near the equator, where the sun is directly overhead for a part of the year, where it shines with great heat, and where there is no winter.

The lowlands here are hot, but the highlands are cooler, as highlands are everywhere. On the Mexican shore at Vera Cruz you would swelter in the heat, and would always be thinking of cool drinks and the electric fan. At the very same moment, if you were only a short distance away, at Jalapa on the highland, you would wear a coat, perhaps a heavy coat in the evening after the sun had set.

The trade wind makes variety of climate. One afternoon I rode some thirty miles in an automobile on the island of Hispaniola, in the country called the Dominican Republic. I was traveling along a little valley that runs nearly east and west between the two main mountain ranges of the island (Fig. 464-A). I was in the valley of a stream that flows eastward. The ground was damp. The sky was somewhat cloudy. Everywhere was the dark green growth of banana trees, coconut trees, orange trees, lemon trees, cassava plants, and vegetables that grew in the gardens of the many people who lived in thatched houses along the road.

The road had a slight grade upward as we went westward. Presently I noticed that we were going down grade. We had passed over into the land drained by the stream that flowed westward. Within ten miles after we had crossed into the westward-sloping land, thorny cactus plants stood by the side of the road. The cactus, as you know, is a desert plant. There were no more banana trees and coconut trees. Houses were few and far apart. The trees were small and scrubby, and bare patches of light-colored, dry-looking earth could be seen between the small and scattered trees. It seemed as though I had gone to some far country.

Why so great a change in such a short distance? This does not happen anywhere in the Northeastern States, the Southern States, or the North Central States of our own country. In all that part of our country the wind blows from all directions almost every week in the year. But the West Indies and Central America are trade-wind lands. You remember (page 444) that, north of the equator, the trade wind blows nearly always from the northeast. Therefore the trade wind blew up the valley of the river that flowed to the eastward, and brought it much rain. When the wind blew over the divide into the valley that sloped west, it no longer made rain. Do you remember what happened in Hawaii (page 444)?

The farther I went down that valley, the lower and lower its elevation became, and the hotter and hotter its temperature. The rainfall became less and less, and its plants were more like those of the desert. Everywhere there was sunshine.

The trade wind blowing nearly all the time from one direction gives to these trade-wind islands a wet side and a dry side, just as we found in Hawaii (page 444). On the southwest side of the island of Hispaniola, in the valley between Port-au-Prince and Ciudad Trujillo (Santo Domingo), so little rain falls that the country is a desert, with salt lakes such as we found in the Great Basin.

With what you now know about trade winds and rain, you can point out which side of Central America has heavy rain and which side has light rain. Almost every West Indian island that has high land has some places with wet climate, thick forests, filled with undergrowth beneath and with climbing vines above, and other places where only cactus and scanty bushes can grow because so little rain falls.

Make your own map of the Southlands. Trace or fill in a map (Fig. 464-A). Color mountains, plains, plateau, and seas. Show boundary lines and place-names of countries and islands.

Stories told by maps. 1. How does the map (Fig. 464-A) tell you that the Southlands have variety of surface? of government?

2. How do the maps (Figs. 457-B and 464-A) tell you that the Southlands have variety of rainfall and of temperature?

Your guest. Pretend that you live in Mexico City, and that you are having a visit by a cousin who has come from the Corn Belt. Use what you have just read to tell your cousin what the Southlands are like. The class will try to find all the important things you leave out.

THE WEST INDIES

Many islands. The map has told you the names of the four big islands of the West Indies. What is the name of the group, and the name of the group that bends around like an arch between Puerto Rico and Trinidad? Most of the islands are mountainous. Only Cuba has wide plains of level land.

Columbus discovered America by accident. He had set out to find a shorter sea route to India and the East Indies. Although he made four different voyages to the newly discovered land, he died thinking he had found a short road to India. He called the people Indians, and later the islands were named the West Indies.

Many peoples. These islands have a great variety of peoples, as we shall find when we study the different parts. When the white men first came, Hispaniola and many of the other islands were populated by people called *Caribs;* they were patch-and-thatch farmers (page 430). The Spaniards quickly made the Caribs slaves, put them to work digging for gold, and treated them so cruelly that nearly all of them soon died. Then Negro slaves were brought from Africa to work the plantations. Now most of the West Indian islands are peopled by Negroes or by people with some Negro blood in their veins.

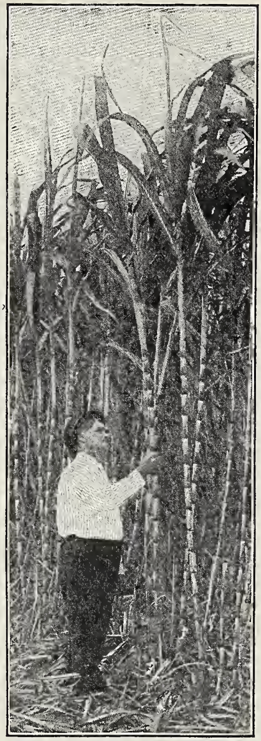

Fig. A. Sugar cane, with leaves clipped, ready to cut.

Only Cuba and Puerto Rico have a population composed mostly of white people. The western half of the island of Hispaniola, known as the Republic of Haiti, has a population nearly all of whom are Negroes. French is the official language because this island was a French colony. The other half of the island, the Dominican Republic, has a population most of whom are mulattoes. Spanish is their language because, for a long time, this was a Spanish colony. The map names will tell you what languages are found on the Lesser Antilles.

In Trinidad and Jamaica, two of the British islands, there are many thousands of dark-skinned people who were recently brought from India. They came by contract to work a certain length of time in the sugar plantations. When their contracts for work were finished, they stayed in the West Indies.

Cuba—queen of sugar. Cuba, the largest of the West Indian islands, is about the size of Pennsylvania, and has as many people as Louisiana and Arkansas. Habana, the capital, is about the size of Buffalo, and has nearly 600,000 people.

The Cubans grow more sugar than any other people in the world, and for that reason most of her people live by the *tin roof-job-store* system (page 432).

In many parts of Cuba you may see villages of iron-roofed houses shaded by a few palm trees. The village is where the sugar workers live. It is on the edge of a wide stretch of sugar-cane fields. Somewhere in the distance is the tall smokestack of a sugar mill (Fig. 468-B). A railroad carries sugar from this mill to Habana or to one of a number of small ports along the coast. Here sugar ships load thousands and thousands of sacks of brown sugar for New Orleans, Charleston,

Fig. A. These women are cutting sugar cane in Barbados (Fig. 464-A). The windmill is of Dutch type, with sails on its wings.

Fig. B. This sugar mill is near Habana, Cuba. The cane, as you see, is hauled from the fields to the mill.

Norfolk, Philadelphia, New York, Boston, Portland, and many European ports.

The sugar exports from Cuba would fill two steamers, each carrying 5,000 tons, every day in the year. In 1930 the Cuban sugar fields produced enough molasses to make almost two gallons of molasses and enough sugar to make about eighty-five pounds of sugar for every man, woman, and child in the United States.

In late years too much sugar has been grown in Cuba and Puerto Rico. The government of Cuba has attempted to control this by joining with other sugar-exporting countries in an agreement to grow less sugar. In 1934 a presidential decree limited the amount of raw sugar which could be produced in Cuba to about 2,300,000 tons a year. The greatest sugar crop that Cuba has ever grown covered only about one seventeenth of the surface of the island. Cuba could easily produce several times as much sugar as at the present time.

Tobacco is the second great export of Cuba. The land west of Habana has a soil that produces a very fine grade of tobacco, and each year millions of dollars' worth of tobacco and millions of cigars are shipped from Habana.

Cuba sends some pineapples, bananas, grapefruit, and coconuts to the United States, but they are not nearly so valuable as the two great exports, sugar and tobacco.

Iron and copper. There are large deposits of iron ore in the mountains of eastern Cuba, near the good harbor of Santiago. Every few days a ship loaded with this ore steams northward, usually to Philadelphia or Baltimore (page 295). Cuba also has copper mines, and in prosperous times she exports this useful metal.

Government. Cuba was a Spanish colony until 1898, but it is now a republic. From 1898 to 1934, however, the United States reserved the right, in case of civil war in Cuba, to send a governor to rule until peace came again. In May, 1934, the United States gave up this right and Cuba is now absolutely independent.

Haiti. Like Cuba, Haiti is a republic which, for many years, was under the supervision of the United States. Our President sent Marines to Haiti to keep order, and advisers to help with the government. The Americans have been withdrawn, however, and now the people of the small republic govern themselves.

Haiti has more people to the square mile than any American state south or west of

Fig. A. Digging asphalt from the famous Pitch Lake of Trinidad. The man at the left is lighting natural gas as it bubbles through the asphalt. What use is made of asphalt?

Pennsylvania. Most of the people of Haiti are Negroes. They make their living in their richly forested country by the *patch-and-thatch* system. Coffee is the chief money crop and the chief export of the island. Growing coffee is a very different kind of industry from growing sugar. Any family can take care of a few coffee trees, while sugar, as you remember (page 467), must have a great mill and hundreds of acres of cane. There are only two such mills in all Haiti. The people also export small quantities of cacao beans, cotton, and logwood, which is used to make fine furniture and dyes.

The Dominican Republic. Most of the people of this end of the mountainous, forested, island of Hispaniola live by *patch-and-thatch* and by selling small quantities of cacao beans, coffee, and leaf tobacco. The chief export of the Dominican Republic is sugar. There are twenty sugar mills, most of which are owned by Americans. Most of the sugar plantations are on the south side of the island, the dry side, where streams of water flowing down from the mountains furnish water to irrigate the dry but fertile plains.

Jamaica. Jamaica is about the size of Connecticut. It is like Puerto Rico in several ways. Both are mountainous, trade-wind islands. They have similar climates, with cool highlands and warm, narrow plains around the shore. While most of the Puerto Ricans are white and of Spanish stock, most of the Jamaicans are of Negro stock who first came as slaves to work the plantations. The English freed their slaves thirty years before slaves were freed in the United States.

Jamaica has a good government, good schools, roads, railroads, and trolley lines. Nearly all the people make their living by farming. They export some coconuts, sugar, and coffee, but the great export is bananas, which are worth more than all the rest of the exports together. Read page 478, which tells about a banana plantation.

The Lesser Antilles. Any geography class would have a delightful journey if it could spend a day or two in any one or all of half a dozen of the islands that spread away in a kind of arch between the Virgin Islands and South America. The people are farmers and fishermen.

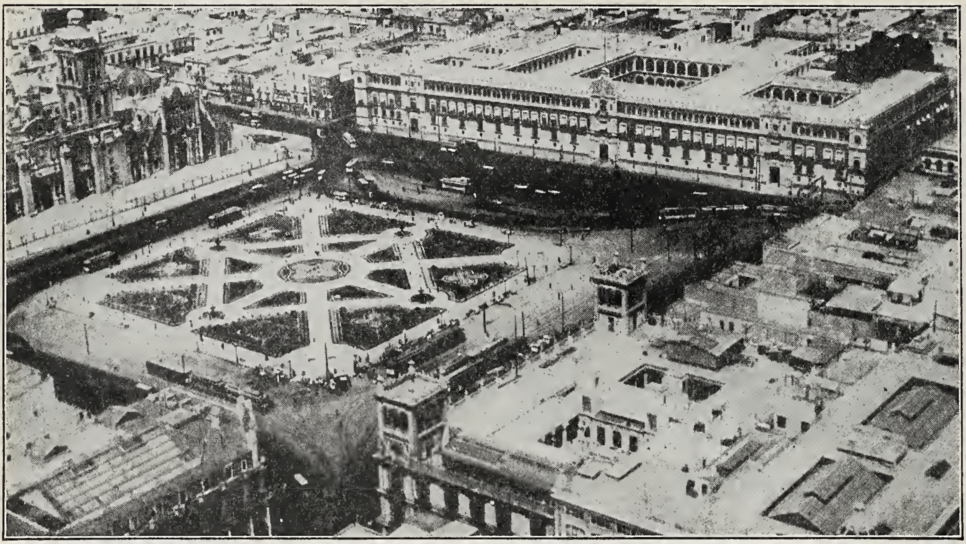

Fig. A. A part of Mexico City as seen from the air. At the left of the open square is the Cathedral, and in front is the palace of the President of the Republic.

Since we cannot make this book too long, we cannot extend our visit to these islands.

Each year more and more of our people take a winter vacation journey to these beautiful and interesting islands.

Barbados is one of the most densely peopled lands in the world, with almost a thousand people to the square mile. Sugar is its chief crop.

Trinidad has a remarkable lake which covers more than a hundred acres and is filled with asphalt. You can walk on the asphalt, but if you stood still very long, you would sink into it. If you dig a hole, it fills itself up again in a short time. Many shiploads of asphalt are taken each year to pave the streets in America and Europe.

Invent a map. Invent a map of the West Indies that will show why these islands are so important to the people of Europe and the United States. Put ships and steamship lines on your map.

Choose an island. Make up a story about your island. Tell about a boy and girl and their parents who live on the island. The story must tell about their house, their work, and their play. Use other books for more material. Make some drawings, or find pictures to make your story more interesting. Be sure to make a story about coffee and another about sugar.

Something to do. Draw on a sheet of paper a map of an island, or make one on a sand table, or with flour and salt. Put on this island a high volcano. Now suppose it is a trade-wind island. Show in some way a place having heavy rainfall, and a place having light rainfall.

Two systems of making a living. Tell about the *patch-and-thatch* system of making a living (page 430) and the *tin-roof-job-store* system. Which would you prefer?

To help you in recognizing southern countries. Copy the following sentences, filling in the blanks:

a. The four largest islands of the West Indies are 1 ——, 2 ——, 3 ——, 4 ——.

b. Countries having two seacoasts are 1 ——, 2 ——, 3 ——, 4 ——, 5 ——.

c. Country having only a west coast is ——.

d. Country having only an east coast is ——.

e. Country in both Torrid and Temperate Zones is ——.

f. Country farthest south is ——.

MEXICO—ITS PEOPLE AND ITS METALS

Great cities of the past. When the first men from Europe reached Mexico, they found a large Indian city near where Mexico City now stands. We are still finding on the uplands of Mexico the ruins of large cities, and huge temples and buildings that these people built before Columbus sailed the Atlantic.

Cortés, the commander of the first Spanish army that came to Mexico, conquered the Indians, and got great stores of gold and silver. He made slaves of many of the Indians, and made them work their own mines for the king of Spain. Spain became the richest country in Europe.

The Mexican people. Many of the Spaniards married Indian wives. The children of people of mixed Indian and Spanish race are called *mestizos*. Today Mexico has many mestizos, many pure-blooded Indians, and only about one quarter of the people are white. Nearly all of these are of Spanish stock. Spanish is the language spoken by the educated people. We call Mexico a *Spanish-American country*. All of the countries of Central America and South America are Spanish-American countries, except four colonies still ruled by European countries, and Brazil, which was settled by the Portuguese.

Map study. After you have looked carefully at the maps (Figs. 464-A and 306-A, 307-A), you will see that the mountains and plateaus of the southwestern United States extend into Mexico.

Measure the distance (Fig. 464-A) from the city of El Paso, on the Rio Grande, to Mexico City. What is the distance between New York City and Chicago? What is the elevation of the land that one passes over in making the journey from El Paso to Mexico City? In what

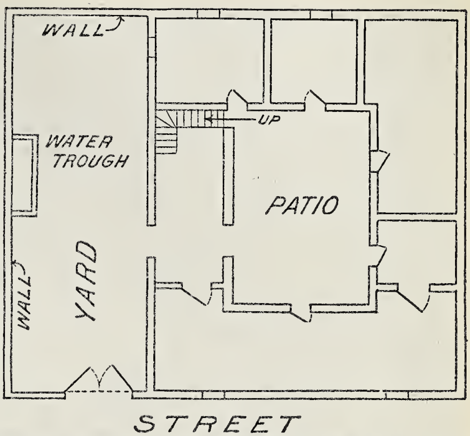

Fig. A. The plan of a Mexican house. The rooms open out of the *patio*, or central courtyard. This is Spanish style. The yard is very private.

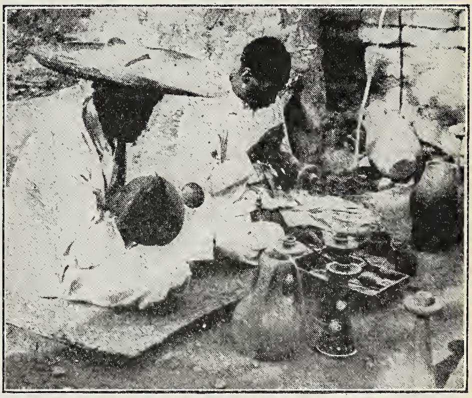

Fig. B. These village Indians of Mexico are making pottery in much the same way as their people have done for ages.

latitude is Mexico City? Name some places to the east of it that are in this latitude and about which we have already studied. Why does one need an overcoat in Mexico City on some summer evenings?

Land of metals. What do the Appendix tables tell you about the population of Mexico City, St. Louis, San Francisco, and New Orleans? The Mexican plateau is mostly dry. It is not a land good for farming. Then why is Mexico City a fine, large city? One word

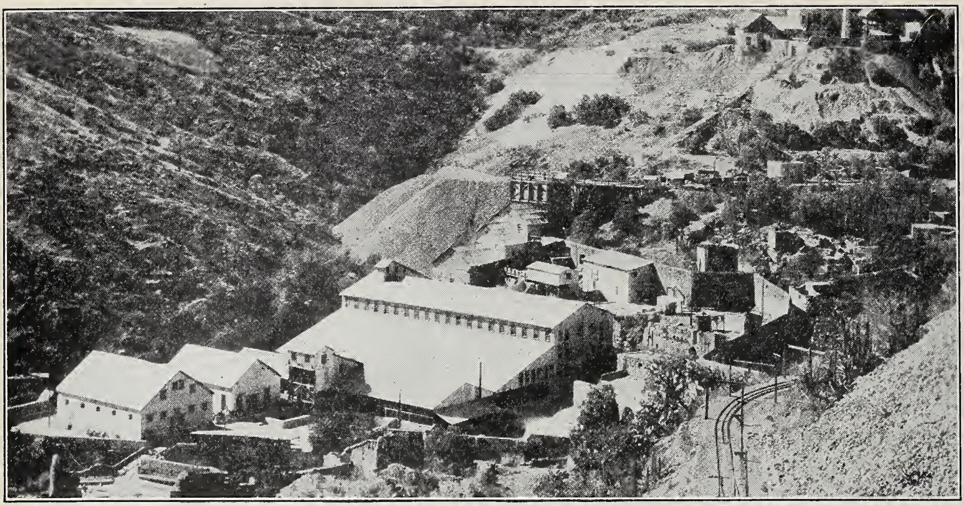

Fig. A. These buildings are part of a silver mine on the plateau of Mexico just north of Mexico City. The hills in the background give a good idea of the plateau country.

gives the answer: *metals*. The uplands of Mexico have sometimes been called the *metal storehouse of the world*. Cortés could scarcely believe his own eyes when he saw how much gold and silver the ancient Mexicans, called *Aztecs*, had. For most of the last four hundred years, silver has been the chief export of Mexico. She now produces nearly half of the silver of the world. There are many mines in the mountains, and most of the cities of the plateau are mining cities. Compare this with the part of the plateau that lies in the United States (Figs. 306-A, 307-A).

Foreigners and the mines. From 1876 to 1911 Mexico was ruled by a man who was part Indian and part Spaniard. His name was Porfirio Diaz. He wanted his country to become like the United States and Canada. He wanted the people to use machines and have railroads. He invited foreigners to come. He gave them lands to cultivate, mines to work, and invited them to build railroads. Therefore foreigners own most of the mines of Mexico. Americans, English, and other Europeans are the engineers and managers, but the Mexican does the heavy work. The people work getting out silver, copper, lead, zinc, and gold; they do not produce enough food for the people.

A free-hand map for your notebook. Draw a map of Mexico. Color the mountains, the plateau, the plains, the waters. Draw the Tropic of Cancer. Show Mexico City and Vera Cruz.

A short list. Write a short list of Mexico's minerals, placing the most important first.

Why's that every person should know. 1. Why must Mexico import so much of her food?

2. Why is Mexico called "The Land of Perpetual Spring"?

Extra work for extra credit. Read in another book about Mexico. Tell the rest of the class about it.

Two strong men. Write two short paragraphs telling of the work of Cortés and of Diaz in Mexico.

Reasons. 1. Why we call Mexico a Spanish-American country.

2. The capital of Mexico is a large city because ——.

3. Foreigners own most of the mines of Mexico because ——.

4. Why the Mexican Plateau is poor farming country.

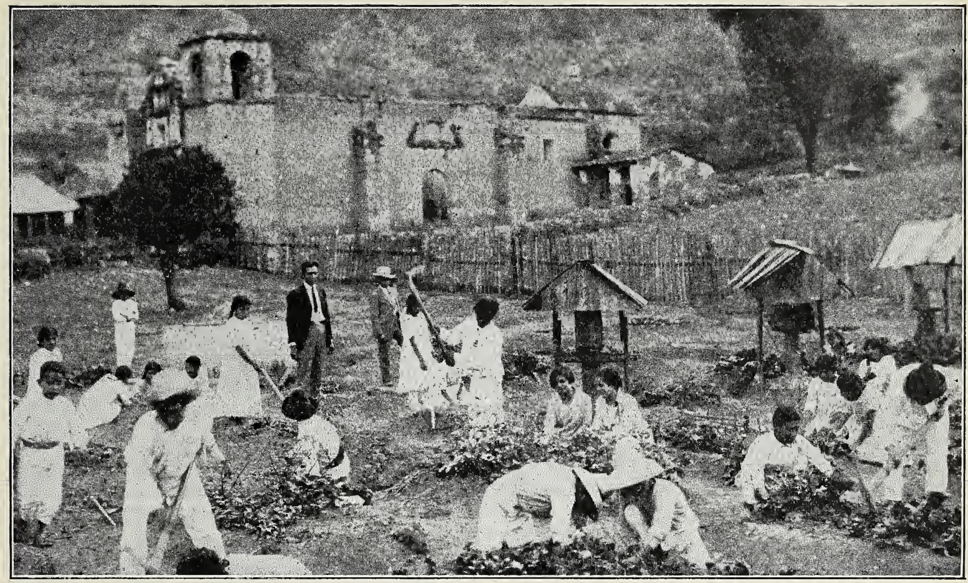

Fig. A. These Mexican boys and girls have a school garden like those of many of their schoolmates in the United States.

A COUNTRY THAT IS THREE STORIES HIGH

Many temperatures. The Mexicans often speak of their land as composed of three zones or kinds of land: the cool lands, the temperate lands, and the hot lands. Let us call it three stories, like a three-story house.

The top story. The plateau is the cool land. It is cool because it is high. It lies between the eastern and western Sierras. These mountains cut off the moist winds and make it a dry land. The mountains above it have more rain, and several great volcanoes have snow and glaciers on their summits. Many mountain streams flow down into this plateau, as they do into the plateaus in our Western States.

The hacienda and the peon. Pablo is an Indian boy who lives on a great estate or ranch in the plateau of Mexico. The Mexican name for a ranch is *hacienda.* After Cortés conquered Mexico, the Spanish governors gave away large tracts of land to Spanish noblemen and soldiers. Often these haciendas had many Indians living upon them, and Pablo's ancestors were living on this same land before Columbus came.

Pablo's family lives in a one-room house made of *adobe,* or sun-dried bricks, with a thick clay roof and a dirt floor. The owner of the hacienda has a large house, with thick brick walls and a tile roof. The owner, who is of the Spanish race, lives in Mexico City most of the time, and leaves the hacienda in care of a mestizo foreman.

Pablo's father is called a *peon.* The foreman lets him have a bit of ground for a garden. A part of it is watered by a stream that comes down from the mountain. The family cultivates this little irrigated patch most carefully. They grow corn, beans, and peppers. The family

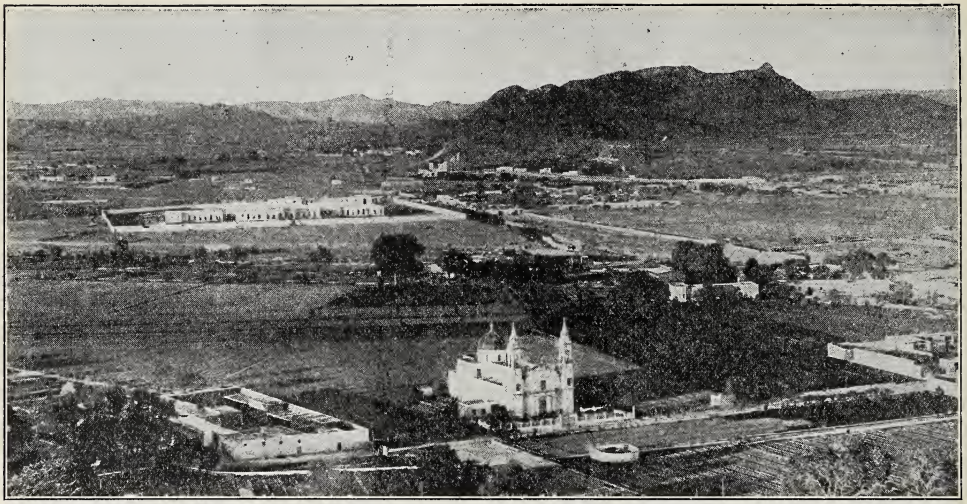

Fig. A. The *top story* of Mexico, a part of the cool plateau land of Mexico. The town which you see is Durango.

Fig. B. Another view of the *top story* of Mexico. This part of the plateau is very dry.

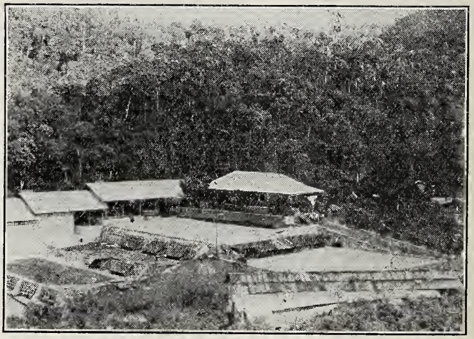

Fig. C. The *middle story* of Mexico. See the drying flats of the coffee plantation.

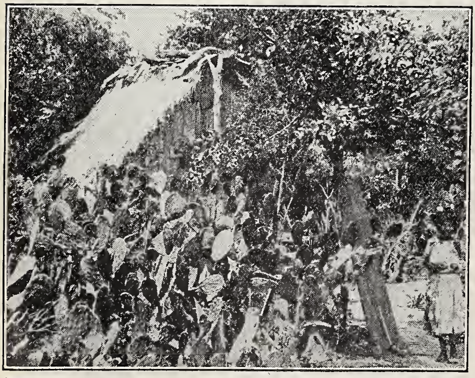

Fig. D. The *bottom story* of Mexico. See the cactus growing near the Indian's hut.

Fig. E. Another view of the *bottom story* of Mexico and Central America.

lives mostly on these three foods, with a little meat once in a while. Pablo does not go to school. There is no school in the village. For this reason most of the people of Mexico cannot read or write.

Pablo's father is a sheep herder. He is often away from home for days at a time with his master's flock of sheep and goats. He goes to distant parts of the ranch to find bushes and bunch grass for his flock to eat. The sheep are not very good sheep because the owner does not give attention to getting fine stock from foreign countries. In fact there are only about a million and a half sheep in all Mexico.

Pablo's house is one of fifteen houses in the peon village. All of the peons work on the hacienda. Many of them plow with slow ox teams and awkward wooden plows.

There are several villages of peons scattered about the hacienda, which is as large as two counties such as we find in the eastern part of the United States. One of the villages is near a mine. All the men in the village work in the mine.

Some of the big haciendas have been given back to the Indians who live upon them. Recently the Mexican government has built some large irrigation reservoirs in the western mountains, and the water irrigates thousands of acres of land in the plateau. In one place near Torreon much good cotton is grown.

The better southern part. In the southern part of Mexico, on the plateau, the land is higher; the summers are not so hot; there is more rain, and here crops can grow without irrigation. Here, near Mexico City or in it, live most of the people of Mexico.

The middle story — the temperate lands. Around the edge of the plateau, or cool top story of Mexico, is a wall of mountains. The outer slopes of the mountains have many little valleys where the weather is neither hot nor cold, but like a warm spring day. Here the traveler may find hundreds of villages tucked away in the mountains.

The houses in these villages of the temperate lands have roofs of grass or palm leaves, and walls of grass or stone, and a dirt floor. The people make a living by growing corn, coffee, bananas, cassava, and vegetables. Trains of pack mules carry bananas, cassava, and other things that will not grow on the plateau up to the people in the cities and mining towns of the plateau. Pack mules are used because the land is too steep for roads.

The bottom story — the hot lands. The hot lands of Mexico are the lowlands near the coasts. The east and the west coast differ very much. One is much wetter than the other.

From what we know of New Mexico, Arizona, and the southern part of California, it is easy to guess that Lower California is dry, and so is the eastern shore of the Gulf of California — so dry that you may go for a hundred miles and never find a stream. If a stream does come down from the mountains it is lost in the desert at the foot of the mountains.

Mexican vegetables for the American Christmas. On the map find the Mexican towns of Topolobampo and San Blas. In this part of the western plain larger streams come down from the mountains and, therefore, the valleys are irrigated. An American company has built a railroad from Nogales all the way to San Blas, and thence to the city of Mexico. At the Christmas season you may buy in Chicago or Winnipeg or Boston, tomatoes and some other early vegetables that have come from the irrigated farms in this western part of Mexico.

Cool or hot, which is better? Since most of the people of Mexico live in the southern and southwestern parts of the plateau, Vera Cruz is their nearest seaport. For a long time it has been the chief seaport of Mexico, yet it has but little more than 50,000 people. It is only about one twentieth as large as Mexico City, and it is not one one hundredth as large as New York, the great port of the United States. Why is such an important port so small? Read what follows to see whether or not you would want to live in Vera Cruz.

The east coast is the wet coast, the trade-wind coast. The hot, moist wind blows into the coast plain from the sea nearly all the year. There are many days of rain. The streams overflow. In some places there are wide swamps back of the coast, and thick forests with tangled vines, where mosquitoes buzz and bite, and gnats and many other insects torment man.

For hundreds of years malaria and the yellow fever and other diseases of the trade-wind swamps killed so many people at Vera Cruz that no one lived there who could get away. The Mexicans called it *the city of the dead.*

All the Central American countries having plateaus are like Mexico in having their capital cities on the plateau, and a much smaller port city on the unpleasant seashore.

Only a very few people live on the eastern coastal plain of any of these countries, yet this low plain gives us three important exports: petroleum, sisal, and bananas.

Petroleum. The northern part of this eastern low plain of Mexico is not so damp and hot as is the part you have just read about. This is very fortunate, because oil from this part of the low plain has been very important in the foreign trade of that country since the time of Porfirio Diaz. Therefore many foreign people had to live and work there.

English and American companies have hired American oil-well drillers and Mexican laborers to drill their wells, not far from Tampico and Tuxpam. From there steamers carry oil to American and European ports. Oil wells usually stop flowing after a few years. As a result, Mexico does not now ship so much oil as formerly.

Add to your map of Mexico. Add dots and initials to show Tampico, Tuxpam, Puerto Mexico, Topolobampo, San Blas, Nogales. Draw a red line to show the railroad from Nogales to Mexico City.

Draw another free-hand map of Mexico. 1. Color the hot, dry lands yellow; color the hot, wet lands green. Figure 464-A will help.

2. Color the cool lands light blue; the cold mountain tops, darker blue.

A pupil says: "I want to raise cattle in Mexico." Another pupil shows on a map the region where the first pupil might live. Another pupil tells about the cattleman's home and work. Thus the class works together (coöperates) to make a complete and interesting story.

Let the class do the same thing when another pupil says:

1. "I want to raise cotton in Mexico."
2. "I want to raise fruits and vegetables."
3. "I want to mine metals."

Some why's to make you think. 1. Why do the Mexicans carry their goods on pack mules?

2. Why are so many Mexicans poor?

3. Why are the larger Mexican cities on the plateau?

4. Why are the seaport towns small?

5. Why is the east coast so rainy?

Several stories. Tell about each of the three stories of Mexico. Why are they different? Do they trade with each other? In which would you prefer to live?

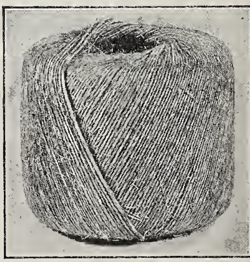

Fig. A. This ball of twine was made from the fibers in the leaves of the henequen plant (Fig. 477-A).

Fig. A. In this picture the Yucatan workmen have cut the broad, spearlike leaves from the henequen plant, tied them in bundles, and loaded some of them on one of the small, flat cars of their little railroad. The fibers in the big blades are the sisal from which cord and rope are made.

YUCATAN

Sisal. Find the peninsula of Yucatan. The northern part of this peninsula is a flat plain, without any highlands to make the trade winds rise and drop their moisture. Therefore it is a dry land, without forests. This dry plain just suits the coarse plant called *henequen* (Fig. 477-A), which looks much like one of our garden plants called the *century plant.* Not far from Progreso you may ride for miles through henequen plantations, where thousands of Indians and mestizos are at work cutting henequen leaves. Small cars carry the leaves to the factories, where the fibers are stripped from the leaves. This long, strong fiber is called *sisal* or *sisal hemp.* It is used for binder twine on the American wheat farms, and also for cordage.

The people of Yucatan sell little else than sisal, and they make half of the world's supply. The steamers from the United States, England, France, and Spain, stopping at Progreso, leave in exchange for sisal all the things you can find in any store.

You remember (page 465) that the southern lands of North America are lands of *variety.* The northern part of Yucatan is the dry sisal country. The southern part has more rain and is covered with a forest where we might tramp for days without seeing a human being. There are no people now, but several hundred years ago great cities were here (Fig. 481-A).

Add to your map of Mexico. Add the name Yucatan and the town of Progreso.

A story from pictures. Tell a story from Figures 476-A and 477-A. In your story use these words: sisal, binder twine, Manila hemp, New York, Indians.

Explain: 1. How railroads allow more coffee and bananas to leave Central America.

2. Why the early Spanish settlers lived on the plateau. Do not forget three words: climate, silver, gold.

Interesting work. Try to find, from books and magazines, pictures of ruins that have been found in Central America; in Mexico.

Newspapers and magazines tell about explorations and about cities that are being dug up.

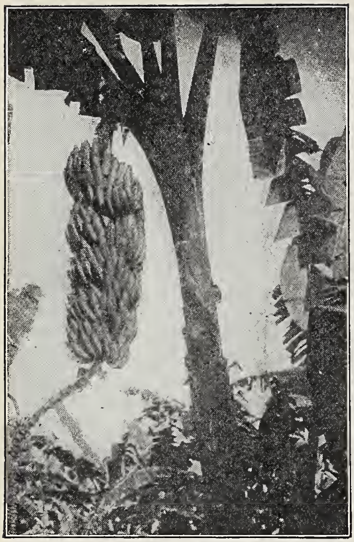

Fig. A. This picture gives you a very good idea indeed of a banana plantation. See the bunch of bananas hanging by its stem, and the loaded tramcar which runs on a narrow track and carries the bananas to the nearest railroad.

Fig. B. The picture at the left shows how a bunch of bananas grows on a banana plant.

THE BANANA TRADE

How do we get bananas? To answer this question, let us first go to New Orleans, where a big white ship lies tied to the wharf. Out of this ship come big bunches of hard, green bananas, riding on a canvas carrier and falling, one after another, into the arms of a stream of men, who carry them into the freight cars waiting on the wharf beside the ship. Hour after hour the bananas roll out of the ship. All day, all night, and all the next day the men work; for bananas, unlike apples, will not keep long, and the thousands of bunches in the ship must come out quickly. If a bunch has any yellow bananas, it is laid aside to be used in New Orleans. Only the green ones are put into the freight cars, one of which is going to Kansas City, another to Butte, Montana, two to Winnipeg, six to Chicago, three to Cleveland, and four to Detroit.

Next to the sugar of Cuba and Puerto Rico, bananas are the chief product we get from the countries around the Caribbean Sea. In several of the Central American countries, many large plantations, with little railroads running through them, have recently been made in the thick forest along the western shore of the Caribbean. The wind blows from the sea and brings plenty of rain to this coastal plain. Most of the work is done by the Jamaican Negroes, who go over and work a few months for the banana companies, and then go back to their little homes. Whenever you see a banana you can think of the black men working among the tall green leaves, where mosquitoes and many other biting insects abound. You can think also of the village where the workers live, of little railroads through the plantations, and of the white steamships.

A banana map. On a blank map of North America, show how bananas reach us from the Southlands.

Picture story. Tell the story of bananas, using the pictures and the text.

Three in one. Why are the large banana plantations found only on the east coasts of Mexico and Central America? Give a temperature reason, a rainfall reason, and a transportation reason.

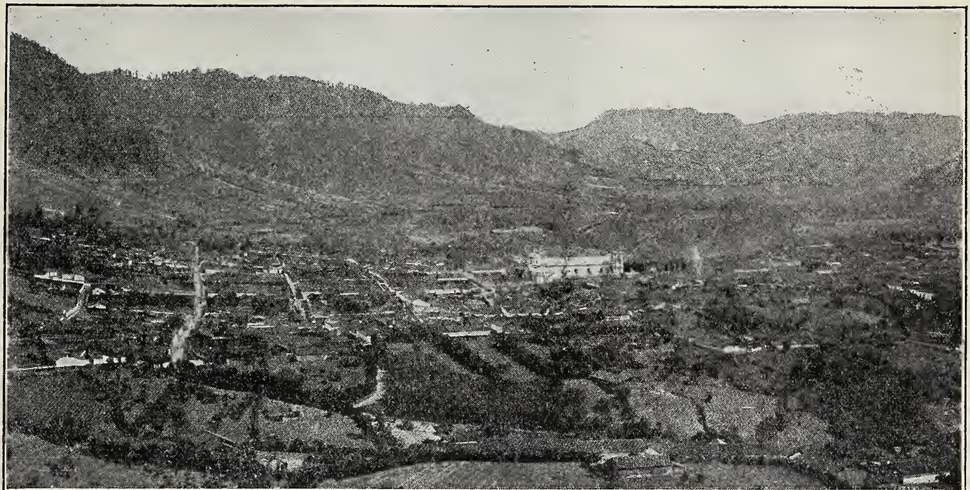

Fig. A. The high plateau in Central America gives springlike weather for most of the year. The town at which you are looking is Totonicapan, 8,500 feet above the level of the sea in Guatemala.

CENTRAL AMERICA BEFORE AND AFTER THE RAILROAD

Buried by jungle and distance. The ports and railroads and the villages of workers of banana land are the new Central America. The old Central America is on the plateau which is nearer to the Pacific Ocean than it is to the Atlantic Ocean. How high is this plateau in Guatemala (Fig. 464-A)? in Salvador? in Honduras? in Nicaragua? in Costa Rica?

The early Spanish settlers did not want to live in the dampness, heat, and among the mosquitoes of the unhealthful coastal plain. They wanted to live on the plateau near the west coast. To get there from the Caribbean shore they had to cross a tangled, thorny jungle and sticky swamps, where even a mule might get stuck in the mud or drowned in a flood. Therefore the early settlers found it easier to sail around Cape Horn to the Pacific coast of Central America, and then to go up several thousand feet to the plateau.

Here they were away from mosquitoes, malaria, yellow fever, and the moist heat that makes a man feel as though he weighed three hundred pounds and could scarcely move such a heavy weight. On the plateau these people lived by the *patch-and-thatch* system, grew corn, wheat, beans, bananas, and kept some cattle and hogs. To get imports, they sent cowhides and a little coffee to Europe. Coffee is a valuable product. Two sacks of it balance nicely across the back of a mule, and can thus be carried down steep mountain sides.

Fig. B. This Central American village is in the hot lowland. Where is the cost of living greater, in your home or in this village?

For more than three hundred years the

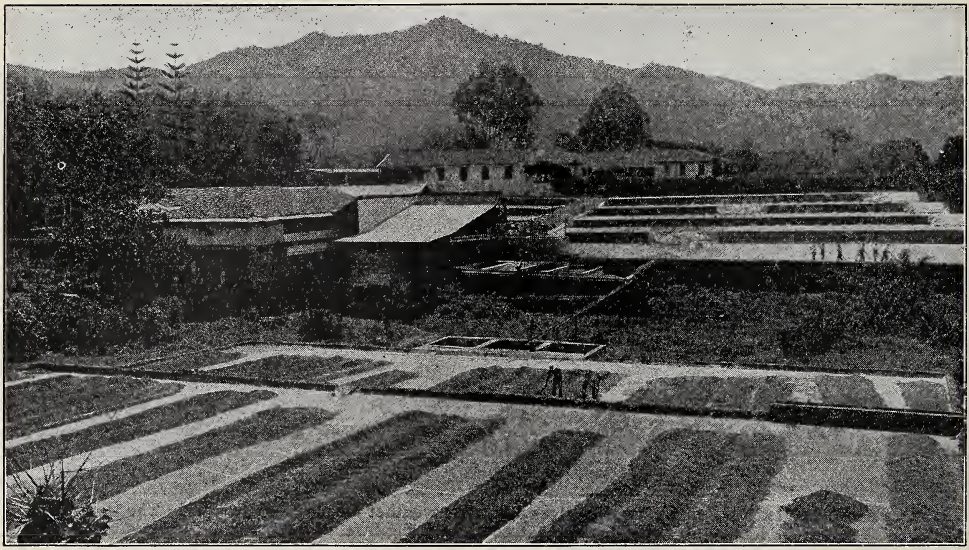

Fig. A. This coffee plantation is near San José, Costa Rica. See the flats on which the coffee is drying.

Fig. B. The coffee pickers, men, women, and children, stop work to have their pictures taken.

trade of the plateau people with Europe was carried on in sailing vessels which went around Cape Horn. They sent their freight by pack mules and sometimes by oxcarts down mountain sides higher than the Appalachians of Pennsylvania. The mountain roads were so bad that these people did less trading even than the colonists of the Atlantic Coastal Plain of the United States did at the same time.

When railroads were built, first to the Pacific coast, then to the Atlantic coast, the pleateau people began to export much more of the fine coffee of their cool hills. Coffee is the chief export of Costa Rica, Guatemala, Nicaragua, and Salvador.

If you look at the map of Honduras, you will see that it has a smaller proportion of plateau than has its neighbors. From its large plain comes more than half of all the bananas of Central America. Bananas are also exported by British Honduras and Panama, whose plateaus are not high enough for coffee to grow. Most of the countries that have coffee for their first export, have bananas for their second export. Most of them also export some cacao and some mahogany.

The population figures of British Honduras and of Costa Rica show how important the plateau is. Although British Honduras has lately begun to export bananas, she has only about five people to the square mile, while Costa Rica has about twenty people to the square mile.

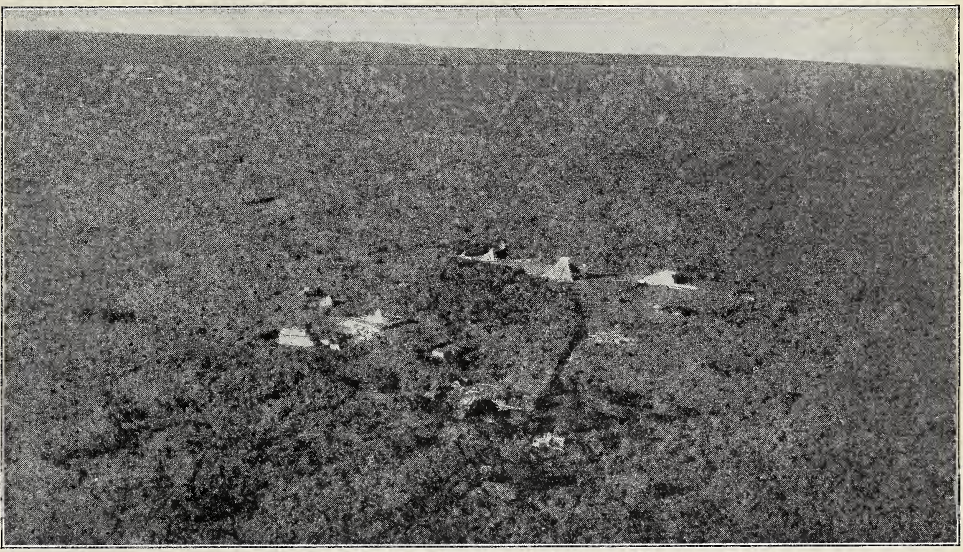

Fig. A. You are in an airplane and flying very high over dense forests in Yucatan. The temples were parts of cities mentioned on page 477. Doubtless most of this forested plain was a busy city before Columbus sailed.

PEOPLES AND GOVERNMENTS IN MEXICO AND CENTRAL AMERICA

Few white people. Mexico and Central America are to each other as are the United States and Canada. The lands are alike, the peoples are alike, and they live in much the same way. The winterless climate of Mexico, Central America, and the West Indies does not suit the white man so well as the bracing, frosty climate of the United States and Canada. In Mexico less than a quarter of the people are white, more than a quarter are Indians, and more than half are a mixture of the Indian and white. There are towns in Mexico where there are hundreds and even thousands of Indians and not six white families.

In the plateaus of Central America the number of white people compared to others is even smaller, and the banana business has brought thousands of West Indian Negroes to the coastal plain.

The cities. Most of the white people live in the towns and cities. The cities of Mexico and Central America are built of stone houses with whitened walls. The houses are often built around a court (Fig. 471-A) like the houses in Spain. In this court are fountains, pools, flowers, and shade trees. The cool, green inside is much more beautiful than the white, glaring outside, where you see only a bare wall with a big door in it. The Indians, the half-breeds, and the Negroes live in the villages by *patch-and-thatch,* or work on plantations and in mines.

Elections, justice, and a fair chance. How can such countries be governed? They are called republics, but often, instead of having elections by voting, some rich man raises an army, drives the president out, and appoints a congress of his friends, who elect him president. If the congress does not do as he says, he drives them out. Where people have

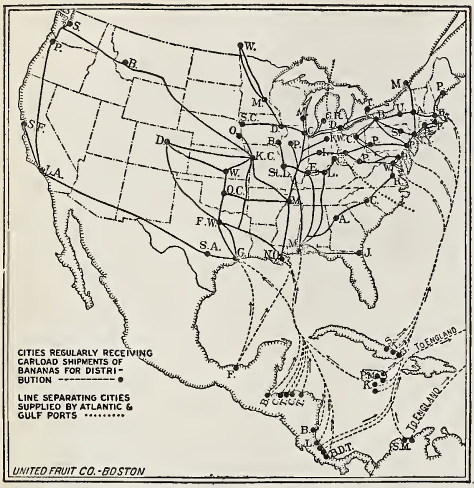

Fig. A. **A banana-trade map. Through what port do your bananas come?**

governments of this sort there is much injustice and much suffering. Many a foreign landowner in Mexico or Central America has said to the *jefe*, or magistrate, "I want some men to work my mine." "All right," the jefe has replied, "give me fifty dollars." Then the jefe has gone down the road, arrested the first half dozen poor men he saw, put them in jail, and fined them twenty dollars each. The mine owner then paid the fines and made the men work for him to pay their debt. This system of keeping a man for debt is called *peonage*. It is done in many countries of Central and South America.

Such injustice has too often discouraged the people of Mexico. Where such things happen, it is easy to see why there are few schools and few industries. It is easy to see why the people plow with an old wooden plow, use few machines, and still farm and do their other work by old-fashioned methods. It is easy to see why millions in Mexico can get little to eat but corn and beans.

Good government is hard to get. You can easily see how the government might be better in your own neighborhood. Mexico has recently started many new schools, and she hopes for a better future. If the Mexicans can get better ways of doing things, they will have more things to sell to us, and can then buy more from us.

The ancient arts. It is hard for us in this country to realize what a great people the Mexicans were at the time the Spaniards conquered that country. In 1932 the graves of some Mexican Indian kings were discovered. They contained jewelry and metal work which showed remarkable workmanship. Many enormous buildings are being dug out from the bushes and rubbish. Some people who study these ruins say that the Mexicans of the year 1500 were as civilized as were the people of Europe.

Have you decided? Which is the more fortunate region, the United States or the Southlands? Turn back to page 465 and tell the class what you have decided about each of the questions.

Catch the class. Let someone draw a big map of the Southlands on the board. Give each child a turn to go to the map and draw a dot, or a line, or a shaded spot, and to call on a classmate to guess what place or condition he has shown. Here are some things you might show: cities, countries, islands, oceans, railroads, wet or dry regions, plateaus or mountains.

Ships' cargoes. On the map (Fig. 464-A), point to the part of the Southlands that provides these cargoes for ships: coffee, bananas, iron ore, sisal hemp, petroleum, silver and gold, sugar, tobacco, mahogany.

Finding places. Find Lake Nicaragua and the narrowest part of Mexico; both are less than 1000 feet above the sea. Except for these places, how high is the western highland that extends from Panama to Alaska?

Cross-word puzzle. Perhaps you can make up a "Cross-word Puzzle" with the words in this chapter, and give it to the class to solve.

SOME IMPORTANT STATISTICS

I. COUNTRIES OF THE WORLD. Area in square miles, total population, population per square mile, value of trade with the United States, and value of total imports and exports.

Several things influence the amount of trade that the people of a country may have. Its trade may be small because the people live so simply that they have very few needs, as in Ethiopia (Abyssinia), or because the country has a great variety of resources and industries. Thus the United States has a greater variety of resources than Great Britian, but less trade per capita because we supply so many of our own needs. It is a good review to explain why the per capita trade of the different countries is large or small.

Country	Year	Area, Square Miles	Total Population (thousands)	Population per Square Mile	Millions of Dollars: 1928 Trade with United States	Millions of Dollars: 1932 Trade with United States	Millions of Dollars: Total Imports and Exports
NORTH AMERICA	......	....	177,500	....	......	......	......
Alaska	1930	586,400	59	0.1	104.4	49.8	50.3
Bermuda	1932	19	28	1,526.3	4.9	3.2	7.1
Canada (land area)	1931	3,542,049	10,374	2.9	1,312.0	380.0	840.8
Alberta	1931	250,925	732	2.9	......	......	......
British Columbia	1931	353,416	694	2.0	......	......	......
Manitoba	1931	231,926	700	3.0	......	......	......
New Brunswick	1931	27,911	408	14.6	......	......	......
Northwest Territories	1931	1,258,217	7	0.006	......	......	......
Nova Scotia	1931	21,068	513	23.7	......	......	......
Ontario	1931	365,880	3,432	9.4	......	......	......
Prince Edward Island	1931	2,184	88	40.3	......	......	......
Quebec	1931	583,895	2,874	4.9	......	......	......
Saskatchewan	1931	240,000	922	3.8	......	......	......
Yukon Territory	1931	206,427	4	0.02	......	......	......
Central America	......	212,012	13,118	....	......	......	......
British Honduras	1931	8,598	651	5.9	5.7	1.5	6.8
Costa Rica	1932	23,000	6,540	23.0	13.3	7.8	14.1
Guatemala	1932	42,364	2,195	52.4	24.5	7.0	18.2
Honduras	1930	46,250	860	18.6	21.9	18.3	26.0
Nicaragua	1930	49,500	925	18.7	11.8	5.1	8.0
Panama	1930	28,575	467	16.3	13.0	7.3	10.9
Panama Canal Zone	1931	549	42	71.9	......	......	......
Salvador	1930	13,176	1,438	109.1	15.0	5.3	10.5
Greenland	1931	46,740	17	....	0.4	......	2.1
Mexico	1930	760,290	16,525	21.7	367.0	100.2	154.6
Newfoundland	1931	42,734	277	6.5	17.5 (Newfoundland and Labrador)	13.8 (Newfoundland and Labrador)	40.5 (Newfoundland and Labrador)
Labrador	1931	110,000	4	0.4			
United States (land area)	1932	2,973,776	124,822	42.0	......	......	2,933.8
West Indies	......	95,800	12,045	....	......	......	......
Bahama Islands	1932	4,404	61	13.8	......	......	4.2
Cuba	1931	44,164	3,962	89.7	414.0	85.1	131.7
Dominican Republic	1932	19,332	1,275	64.7	28.4	7.5	19.0
Haiti	1929	10,204	2,550	249.9	13.5	5.8	14.7
Jamaica	1932	4,450	1,051	236.1	18.3	6.0	27.0
Puerto Rico	1931	3,435	1,574	458.2	186.3	123.1	132.5
Virgin Islands	1930	133	22	165.4	3.5	1.3	2.5
British West Indies (including Jamaica)	1931	12,611	2,023	160.4	141.5	14.7	86.4
French West Indies	1931	1,068	506	475.6	......	2.4	29.0
Netherland West Indies	1931	403	72	188.6	......	30.7	129.8
SOUTH AMERICA	......	....	85,000	....	......	......	......
Argentina	1931	1,079,965	11,659	10.8	260.7	58.4	546.1
Bolivia	1931	514,600	3,052	5.9	10.9	3.9	15.1
Brazil	1931	3,286,170	41,478	12.6	310.5	116.1	288.7
Chile	1932	286,396	4,402	15.2	107.7	11.7	44.6
Colombia	1932	444,100	8,828	18.9	146.6	63.9	96.1
Ecuador	1931	110,000	2,500	22.7	9.1	5.5	14.9
Falkland Islands	1931	5,618	3	0.5	......	......	......
Guiana, British	1931	89,480	311	3.5	2.5	0.9	12.4
Guiana, French	1931	34,749	29	1.4	0.2	0.1	2.6
Paraguay	1930	176,000	852	4.8	2.3	0.5	11.3
Peru	1930	524,800	6,237	11.9	65.1	11.4	58.0
Surinam (Netherland Guiana)	1931	54,305	155	2.9	2.6	1.3	4.0
Uruguay	1931	72,172	1,938	26.8	33.3	3.7	52.4
Venezuela	1932	393,976	3,262	8.2	63.3	30.7	118.0

Country	Year	Area, Square Miles	Total Population (thousands)	Population per Square Mile	Millions of Dollars		
					1928 Trade with United States	1932 Trade with United States	Total Imports and Exports
EUROPE	......	....	535,000	....	......	......	......
Albania	1930	10,629	1,003	94.4	......	0.2	7.1
Andorra	......	191	5	26.2	......	......	......
Austria	1931	32,377	6,733	207.6	29.3	10.0	302.3
Belgium	1931	11,754	8,159	688.4	146.7	59.4	864.0
Bulgaria	1932	39,825	6,128	151.4	1.2	0.7	49.3
Czechoslovakia	1932	54,196	14,915	273.9	66.3	46.9	438.0
Danzig	1929	754	408	541.1	......	......	......
Denmark (excluding Faeröerne)	1932	16,576	3,590	215.1	69.0	17.6	428.1
Faeröerne (Faeröe Islands)	1930	540	24	44.4	......	......	......
Estonia	1933	18,358	1,124	61.0	4.0	1.4	21.3
Finland	1931	132,578	3,667	27.6	33.2	11.0	126.1
France (total)	1931	212,736	41,835	196.7	580.7	151.9	1,941.2
Corsica	1931	3,367	297	88.2	......	......	......
Germany	1932	180,986	64,776	357.9	676.9	208.0	2,478.7
Gibraltar (British)	1931	2	21	10,686.0	......	......	......
Great Britain and Northern Ireland	1931	94,281	46,189	489.9	1,195.0	347.1	3,924.0
England	1931	50,327	37,355	742.2	......	......	......
Scotland	1931	30,405	4,843	159.5	......	......	......
Wales	1931	8,016	2,593	323.5	......	......	......
Northern Ireland	1931	5,237	1,257	240.0	......	......	......
Channel Islands	1931	75	93	1,240.8	......	......	......
Isle of Man	1931	221	49	223.2	......	......	......
Greece (total)	1932	50,270	6,483	127.3	36.5	13.1	65.0
Crete	1928	3,195	386	121.1	......	......	......
Hungary	1932	35,875	8,781	243.5	4.9	2.9	116.4
Iceland	1930	39,709	109	2.7	0.3	0.4	12.3
Irish Free State	1932	26,601	2,974	111.2	24.8	5.0	243.7
Italy (total)	1932	119,744	41,814	344.3	289.1	89.7	773.0
Sardinia	1931	9,299	973	104.6	......	......	......
Sicily	1931	9,935	3,897	392.2	......	......	......
Latvia	1932	25,402	1,920	75.5	2.4	0.8	34.9
Liechtenstein	1930	65	10	157.1	......	......	......
Lithuania	1933	21,490	2,422	111.4	1.9	0.7	35.6
Luxembourg	1931	999	300	301.3	......	......	......
Malta (British)	1931	122	242	1,980.5	......	......	12.9
Monaco	1928	8	25	3,125.0	......	......	......
Netherlands	1933	13,214	8,183	607.7	133.8	46.2	862.5
Norway	1932	119,148	2,831	23.6	56.1	24.9	228.6
Poland	1932	149,957	32,176	214.2	43.9	12.8	218.3
Portugal (total)	1931	35,880	6,717	187.2	15.2	10.1	81.5
Azores	1930	924	254	275.0	......	......	......
Madeira Islands	1930	314	210	675.8	......	......	......
Rumania	1931	113,887	18,166	158.3	......	3.7	170.8
San Marino	1932	38	14	368.4	......	......	......
Spain (total)	1932	194,237	23,656	121.8	118.3	41.2	330.6
Balearic Isles	1932	1,908	368	192.8	......	......	......
Canary Islands	1932	2,807	565	201.3	......	......	......
Sweden	1932	158,510	6,190	38.7	100.6	78.6	388.3
Switzerland	1932	15,944	4,120	256.2	82.8	32.8	478.1
Turkey in Europe (see Asia)	1930	9,257	1,072	115.8	......	......	......
U. S. S. R. (Soviet Union) (see Asia)	1933	8,244,228	165,700	19.7	86.9	25.1	650.2
Russia S. F. S. R. (Europe and Asia)	1931	7,628,546	110,933	14.5	......	......	......
Transcaucasian S. F. S. R.	1931	71,232	6,427	90.2	......	......	......
White Russia S. S. R.	1931	48,954	5,246	107.2	......	......	......
Ukraine S. S. R.	1931	174,413	31,403	180.0	......	......	......
Yugoslavia	1931	96,010	13,931	145.0	5.3	2.6	97.0
ASIA	......	....	1,100,000	....	......	......	......
Afghanistan (estimated)	......	250,000	11,000	27.9	......	......	......
Arabia (estimated)	......	1,000,000	7,000	7.0	......	......	......
Aden Protectorate (British)	......	9,000	100	11.1	3.5	0.6	26.3
Oman	......	82,000	500	6.1	......	......	......
Saudi	......	....	4,000	....	......	......	......

Country	Year	Area, Square Miles	Total Population (thousands)	Population per Square Mile	Millions of Dollars: 1928 Trade with United States	1932 Trade with United States	Total Imports and Exports
ASIA—*Continued*							
Yemen	......	75,000	2,300	30.7	......	......	......
Bhutan	......	18,000	300	16.7	......	......	......
Ceylon	1931	25,332	5,313	209.7	51.6	11.5	101.5
Chinese Republic	1932	4,300,000	474,787	110.4	199.1	111.9	533.5
China Proper	1930	1,555,000	462,387	297.4	......	......	......
Manchuria (Manchoukuo)	1930	364,000	26,623	73.1	......	......	......
Mongolia	1930	1,368,000	6,160	4.5	......	......	......
Sinkiang (Chinese Turkestan)	1930	550,000	2,552	4.6	......	......	......
Tibet	1930	463,000	3,722	8.0	......	......	......
Cyprus	1931	3,584	348	97.1	......	......	7.9
French Indo-China	1931	284,900	21,600	75.8	1.6	1.4	77.9
India and Dependencies	1931	1,819,000	352,987	194.1	188.2	54.2	716.3
British India	1931	1,107,968	271,749	245.3	......	......	......
Baluchistan	1931	134,638	869	6.4	......	......	......
Burma	1931	233,492	14,667	62.4	......	......	......
Native States	1931	711,032	81,238	114.3	......	......	......
Iraq	1931	143,250	3,250	22.7	......	3.0	30.9
Japanese Empire	1930	260,514	90,395	347.0	714.7	272.9	989.1
Japan Proper	1933	147,462	66,297	449.6	......	268.5	798.7
Chosen (Korea)	1930	85,228	21,058	247.1	......	1.5	177.6
Karafuto (Sakhalin)	1930	13,934	295	21.2	......	......	......
Taiwan (Formosa)	1930	13,840	4,715	331.9	......	2.9	12.8
Malaya, British	1931	52,603	4,354	86.1	......	32.2	285.0
Federated Malay States	1931	27,430	1,713	62.4	......	......	......
Non-federated Malay States	1931	22,040	1,527	69.3	......	......	......
Straits Settlements	1931	1,535	1,114	725.7	......	......	......
British North Borneo	1931	31,106	270	8.7	......	......	......
Brunei	1931	2,500	39	15.6	......	......	......
Sarawak	1931	50,000	600	12.0	......	......	......
Nepal	......	54,000	5,600	103.7	......	......	......
Netherland India	1930	733,494	60,731	82.8	122.3	36.3	366.8
Borneo	1930	206,115	2,195	10.6	......	......	......
Celebes	1930	73,180	4,227	57.8	......	......	......
Java and Madoera (Madura)	1930	51,219	41,720	814.5	......	......	......
New Guinea and Molucca Islands	1930	192,453	893	4.6	......	......	......
Sumatra	1930	163,138	7,661	47.0	......	......	......
Other Islands	1930	47,389	4,035	85.1	......	......	......
Palestine (British Mandate)	1931	8,880	1,035	116.6	1.3	1.8	36.4
Persia	1930	628,000	10,000	15.9	9.5	3.8	89.0
Philippine Islands (U. S.)	1931	114,400	12,419	108.6	193.7	125.8	174.7
Siam	1931	200,234	11,940	58.4	2.9	1.6	75.6
Syria and Lebanon (French Mandate)	1931	77,220	2,768	35.8	6.5	2.3	44.8
Transjordania	1931	15,444	270	17.5	......	......	......
Turkey (Europe and Asia)	1930	294,492	14,100	47.9	17.1	6.8	88.6
Turkey in Asia (see Europe)	1930	285,235	13,028	42.9	......	......	......
U. S. S. R. (Soviet Union) (see Europe)							
Tadzhik S. S. R	1931	54,826	1,174	21.4	......	......	......
Turcoman S. S. R	1931	189,658	1,138	6.0	......	......	......
Uzbek S. S. R	1931	75,598	4,685	62.0	......	......	......
AUSTRALIA, NEW ZEALAND, AND LARGER ISLANDS OF THE PACIFIC	......	....	10,000	....	......	......	......
Australia	1931	2,974,581	6,526	2.2	262.0	33.3	455.8
Federal Territory	1931	940	9	2.7	......	......	......
New South Wales	1931	309,432	2,518	6.8	......	......	......
Northern Territory	1931	523,620	4	0.01	......	......	......
Queensland	1931	670,500	964	1.1	......	......	......
South Australia	1931	380,070	585	1.3	......	......	......
Tasmania	1931	26,215	223	8.2	......	......	......
Victoria	1931	87,884	1,801	17.4	......	......	......
Western Australia	1931	975,920	422	0.3	......	......	......
Fiji Islands (British)	1932	7,435	186	24.9	......	......	8.4

Country	Year	Area, Square Miles	Total Population (thousands)	Population per Square Mile	Millions of Dollars: 1928 Trade with United States	1932 Trade with United States	Total Imports and Exports
AUSTRALIA, NEW ZEALAND—*Continued*							
Guam (U. S.)	1930	206	19	92.2	0.3	0.2	0.5
Hawaiian Islands (U. S.)	1931	6,407	382	59.6	192.1	141.2	147.1
New Caledonia (French)	1931	7,202	57	7.6	......	......	......
New Guinea, Territory of (Australian Mandate)	1931	93,460	390	4.2	......	......	......
Bismark Archipelago	1931	19,660	143	7.2	......	......	......
German Solomon Islands	1931	4,100	40	9.8	......	......	......
Northeastern New Guinea	1931	69,700	207	3.0	......	......	......
New Hebrides (British)	1931	4,633	63	13.6	......	......	......
New Zealand	1932	103,415	1,455	14.7	52.3	12.8	189.8
Papua, Territory of (Australian Mandate)	1930	90,540	276	3.1	......	......	......
Samoa, Western (New Zealand Mandate)	1932	1,260	46	36.5	......	......	......
Samoan Islands (U. S.)	1930	76	10	132.3	......	......	......
Solomon Islands (British Protectorate)	1931	14,600	94	6.4	......	......	......
Tonga (Friendly Island) (British)	1931	390	29	74.4	......	......	......
AFRICA	......	....	150,000	....	......	......	......
Independent Countries:							
Egypt	1932	386,000	14,945	....	45.2	7.9	191.4
Egypt (excluding desert)	1932	13,600	14,945	1,098.9	......	......	......
Ethiopia (estimated)	1930	347,490	10,000	28.8	......	0.3	......
Liberia (estimated)	1930	46,332	2,500	54.0	1.1	0.1	1.5
International (British, French, Italian, Spanish):							
Tangier Zone of Morocco	1931	225	51	226.7	......	......	......
Belgian Sphere of Influence:							
Belgian Congo	1931	920,895	9,610	10.4	16.3	1.7	35.4
Ruanda-Urundi (Belgian Mandate)	1929	20,120	3,485	173.3	......	......	......
British Territory and Sphere of Influence:							
Anglo-Egyptian Sudan	1930	1,008,100	5,606	5.6	......	......	26.0
Basutoland	1931	11,716	650	55.5	......	......	......
Bechuanaland	1921	275,000	153	0.6	......	......	......
British East Africa	1931	686,956	15,894	23.1	......	......	......
Kenya	1931	225,100	3,041	13.5	......	......	47.5
Tanganyika (Mandate)	1931	366,632	5,064	15.0	......	......	14.3
Uganda Protectorate	1931	94,204	3,554	37.7	......	......	(see Kenya)
Zanzibar Protectorate	1931	1,020	235	....	......	......	6.2
Pemba	1931	380	97	255.3	......	......	......
Zanzibar	1931	640	138	215.6	......	......	......
British Somaliland	1931	68,000	345	5.1	......	......	......
British West Africa	1931	499,623	16,278	32.6	......	......	......
Gambia	1931	4,002	200	50.0	......	......	2.3
Gold Coast, Ashanti and Northern Territory	1931	91,690	3,124	34.1	......	7.3	40.1
Nigeria	1931	372,674	19,928	53.4	......	4.9	58.4
Northern Nigeria	1931	281,778	11,435	40.6	......	......	......
Southern Nigeria	1931	90,896	8,493	93.4	......	......	......
Sierre Leone	1931	30,931	1,672	54.1	......	......	7.8
Cameroons (Mandate)	1931	34,236	700	20.4	......	......	......
Mauritius	1931	720	393	545.8	......	......	14.4
Northern Rhodesia	1931	287,950	1,345	4.6	......	......	......
Nyasaland Protectorate	1931	47,949	1,603	33.4	......	......	4.9
St. Helena	1931	47	4	85.1	......	......	......
Southern Rhodesia	1931	150,344	1,109	7.4	......	1.6	23.4
South West Africa (Union of South Africa Mandate)	1931	322,393	241	0.8	......	......	14.0
Swaziland	1931	6,704	125	18.6	......	......	......
Togoland (Mandate)	1931	13,240	294	22.2	......	......	......

Country	Year	Area, Square Miles	Total Population (thousands)	Population per Square Mile	Millions of Dollars: 1928 Trade with United States	1932 Trade with United States	Total Imports and Exports
AFRICA—*Continued*							
Union of South Africa	1932	471,917	8,251	17.5	62.8	22.2	251.8
Cape of Good Hope	1932	276,536	3,164	11.4	......	......	......
Natal	1932	35,284	1,721	48.7	......	......	......
Orange Free State	1932	49,647	762	15.3	......	......	......
Transvaal	1932	110,450	2,604	23.6	......	......	......
French Sphere of Influence:							
Algeria	1931	222,206	6,553	29.5	18.2	1.4	314.3
Cameroon (Mandate)	1931	166,489	2,192	13.2	......	......	6.1
French Equatorial Africa	1931	915,057	3,192	3.4	......	......	13.4
French West Africa	1931	1,799,100	14,576	8.1	......	......	40.0
Dakar and Dependencies	1931	61	54	885.0	......	......	......
Dahomey	1931	47,142	1,112	23.5	......	......	......
French Guinea	1931	96,852	2,237	23.0	......	......	......
French Sudan	1931	561,303	2,856	5.0	......	......	......
Ivory Coast	1931	125,067	1,866	14.9	......	......	......
Mauritania	1931	322,335	324	1.0	......	......	......
Niger	1931	455,405	1,543	3.3	......	......	......
Senegal	1931	77,750	1,584	20.3	......	......	......
Upper Volta	1931	113,185	3,000	26.4	......	......	......
Madagascar	1931	238,013	3,759	15.7	0.5	0.4	26.0
Morocco	1931	162,162	5,057	31.2	4.0	5.4	96.9
Somali Coast	1931	8,880	69	7.8	......	......	18.2
Togoland (Mandate)	1931	20,077	750	37.3	......	......	......
Tunisia	1931	48,332	2,411	49.9	4.0	2.5	118.3
Italian Sphere of Influence:							
Eritrea	1931	45,754	622	13.5	......	......	......
Italian Somaliland	1931	194,000	1,011	5.2	......	......	......
Libya	1931	633,100	706	1.1	......	......	......
Cirenaica	1931	285,640	165	0.6	......	......	......
Tripolitania	1931	347,500	541	1.6	......	......	......
Portuguese Sphere of Influence:							
Angola (Portuguese West Africa)	1931	486,079	4,182	8.6	......	......	......
Mozambique (Portuguese East Africa)	1931	297,894	3,996	13.4	......	3.5	19.5
Portuguese Guinea	1930	13,944	365	26.2	......	......	......
Spanish Sphere of Influence:							
Rio de Oro, Adrar and Ifni	1927	110,165	22	0.2	......	......	......
Spanish Guinea	......	10,036	140	13.9	......	......	......
Spanish Morocco	1931	13,125	717	54.6	......	......	......

II. PRODUCTION OF CRUDE PETROLEUM AND COPPER

WORLD PRODUCTION OF CRUDE PETROLEUM

(Millions of barrels of 42 United States gallons)

Country	1910	1920	1932
United States	210	443	782
U. S. S. R. (Russia)	70	25	155
Venezuela	...	...	116
Rumania	10	7	54
Persia	...	12	49
Netherland India	11	18	39
Mexico	4	157	33
World total	328	689	1,306

PRODUCTION OF COPPER BY COUNTRIES

(Thousand tons)

Country	1881	1900	1929	1931
United States	36	303	1,026	525
Belgian Congo	...	...	151	169
Chile	43	29	349	248
Canada	1	9	121	146
Japan	4	31	83	84
Mexico	...	25	87	58
U. S. S. R. (Russia)	...	...	41	53
Peru	1	9	60	49
Spain and Portugal	43	59	54	37
Germany	14	23	32	31
World total	181	545	2,128	1,501

III. SOME IMPORTANT FIGURE FACTS

Southern States	Rural Population (thousands)	Per Cent People in Cities	Per Cent Area in Crops	Per Cent Area in Woodlands	Cotton (thousand bales)	Sugar (thousand tons)	Fruit (carloads shipped)	Vegetables (carloads shipped)	Corn Harvested for Grain (thousand bushels)	Tobacco Produced (thousand pounds)	Value of Crops (millions and tenths of million dollars)
Texas	3,435	41.0	20.7	10.7	3,793	..	3,460	50,267	66,251	....	617.9
Oklahoma	1,574	34.3	39.0	17.0	1,130	..	51	3,521	44,830	....	245.6
Arkansas	1,472	20.6	23.5	42.2	1,398	..	1,411	2,435	27,388	....	210.2
Louisiana	1,268	39.7	16.3	41.8	799	172	2,646	6,376	18,280	....	149.8
Kentucky	1,816	30.6	26.9	26.2	9	..	439	874	61,008	376,649	174.7
Tennessee	1,720	34.3	28.7	34.2	504	..	1,427	7,551	61,046	112,237	187.8
Mississippi	1,671	16.9	25.3	40.0	1,875	..	107	6,397	34,936	....	270.5
Alabama	1,902	28.1	25.0	42.3	1,313	..	962	5,847	35,684	357	207.1
West Virginia	1,238	28.4	12.4	41.4	....	..	3,647	96	11,656	5,362	51.9
Virginia	1,636	32.4	19.6	37.6	52	..	9,905	33,870	32,773	115,826	156.9
Delaware	115	51.7	40.1	16.5	....	..	1,587	1,647	3,467	....	15.0
Maryland	657	59.8	33.4	22.3	....	..	1,917	5,955	14,543	21,624	65.8
North Carolina	2,360	25.5	22.4	43.2	764	..	2,998	13,606	35,609	454,223	253.8
South Carolina	1,368	21.3	25.8	41.4	836	..	756	16,682	19,326	83,303	139.5
Georgia	2,013	30.8	27.7	39.6	1,344	..	8,801	27,974	39,493	82,364	232.4
Florida	708	51.7	5.6	42.8	34	..	49,699	45,490	6,618	9,248	90.3

IV. SOME IMPORTANT FIGURE FACTS

North Central States	Rural Population, (thousands)	Per Cent People in Cities	Per Cent Area in Crops	Per Cent Area in Woodlands	Wheat (thousand bushels)	Corn Harvested for Grain (thousand bushels)	Hay (thousand tons)	Potatoes (thousand bushels)	Value of Crops (millions and tenths of million dollars)	Total Value of Fisheries (thousand dollars)
North Dakota	568	16.6	54.6	0.8	95,574	2,173	2,363	6,695	181.3	....
South Dakota	562	18.9	38.6	2.5	34,045	84,570	2,645	4,170	171.2	18
Nebraska	892	35.3	45.4	1.3	53,868	216,020	4,575	9,350	299.1	15
Kansas	1,151	38.8	50.7	1.4	148,483	101,356	2,628	3,770	299.2	21
Minnesota	1,306	49.0	37.6	27.0	19,760	104,419	5,550	25,417	309.9	726
Iowa	1,492	39.6	63.9	4.2	7,990	389,000	5,384	7,614	466.4	404
Missouri	1,770	51.2	35.5	25.6	15,117	112,348	3,565	3,926	214.3	115
Wisconsin	1,385	52.9	28.8	31.5	1,836	26,019	6,227	20,590	228.1	1,830
Michigan	1,540	68.2	24.7	35.7	13,711	15,635	3,495	15,912	175.3	3,248
Illinois	1,995	73.9	58.9	5.7	30,151	275,850	3,611	3,921	387.2	1,021
Indiana	1,433	55.5	50.8	9.6	25,190	114,871	2,450	4,145	198.1	327
Ohio	2,139	67.8	43.2	11.5	30,290	102,177	3,457	10,032	232.8	1,040

V. SOME IMPORTANT FIGURE FACTS

Western States	Rural Population, (thousands)	Per Cent People in Cities	Per Cent Area in Crops	Per Cent Area in Woodlands	Wheat (thousand bushels)	Sugar (thousand tons)	Potatoes (thousand bushels)	Hay (thousand tons)	Fruit (carloads shipped)	Vegetables (carloads shipped)
Washington	679	56.6	14.7	33.4	42,589	....	7,188	1,475	52,468	14,424
Oregon	464	51.3	6.8	31.5	21,527	....	3,364	1,828	12,518	4,551
California	1,517	73.3	8.4	18.6	10,958	124	6,489	4,099	183,624	122,274
Idaho	316	29.1	7.6	27.0	28,591	66	13,405	2,333	8,720	23,729
Nevada	57	37.8	0.7	9.9	356	....	542	545	....	629
Utah	242	52.4	2.8	10.3	5,310	78	1,975	1,373	1,507	2,405
Montana	357	33.7	12.2	14.2	40,558	75	1,843	2,235	391	467
Wyoming	155	31.1	3.6	8.6	4,298	94	1,834	1,212	1	2,210
Colorado	516	50.2	12.7	19.7	17,332	407	14,649	2,563	2,745	32,818
Arizona	286	34.4	0.9	17.2	349	....	157	302	650	16,185
New Mexico	317	25.2	2.3	16.3	4,432	....	319	322	5	629

ABOUT THE SOUTHERN STATES

Total Value of Fisheries (thousand dollars)	Cattle, including Milk Cows (thousands)	Milk Cows (thousands)	Coal (thousand tons)	Pig Iron shipped from blast furnaces (thousand tons)	Petroleum (thousand barrels)	Total Value of Minerals (thousand dollars)	Total Value Added by Manufacturing (thousand dollars)	Cotton Spindles (thousands)	Cotton Looms (active)	Southern States
962	6,603	1,076	836	....	289,965	495,820	460,307	282	5,606	Texas
31	2,098	589	2,546	....	215,227	516,685	149,404	....	....	Oklahoma
678	813	339	1,590	....	19,663	41,325	94,255	....	....	Arkansas
3,362	730	223	....	....	23,107	62,726	246,497	....	....	Louisiana
174	1,086	474	50,697	85	7,345	132,650	236,080	....	1,470	Kentucky
320	1,074	428	5,103	42	19	40,720	322,898	613	8,653	Tennessee
1,213	1,009	418	....	....	....	2,573	107,325	....	3,457	Mississippi
443	800	332	15,240	2,294	....	65,402	258,125	1,862	32,925	Alabama
7	556	183	120,040	705	5,092	346,565	251,615	....	....	West Virginia
7,286	833	335	11,115	51	....	39,753	380,086	688	18,716	Virginia
336	54	30	....	....	....	467	69,151	....	....	Delaware
4,295	319	164	2,288	981	....	18,470	422,097	....	1,136	Maryland
2,544	533	266	....	....	....	10,964	693,013	6,229	81,648	North Carolina
275	270	135	....	....	....	3,592	159,351	5,676	132,772	South Carolina
877	783	302	....	....	....	15,294	294,649	3,240	55,011	Georgia
6,120	431	76	....	....	....	14,804	135,488	....	....	Florida

ABOUT THE NORTH CENTRAL STATES

All cattle, including milk cows (thousands)	Milk Cows (thousands)	Swine (thousands)	Sheep (thousands)	Coal (thousand tons)	Pig Iron shipped from blast furnaces (thousand tons)	Iron ore shipped from mines (thousand tons)	Total Value of Minerals (thousand dollars)	Total Value Added by Manufacturing (thousand dollars)	Petroleum (thousand barrels)	North Central States
1,454	479	628	857	1,630	....	....	3,466	15,637	....	North Dakota
1,974	488	2,637	1,150	....	....	....	8,914	22,681	....	South Dakota
3,150	576	4,679	496	....	....	....	4,845	119,994	....	Nebraska
3,224	669	2,473	574	2,360	....	....	124,472	205,367	41,617	Kansas
3,156	1,442	3,315	927	....	267	34,166	136,350	404,995	....	Minnesota
4,136	1,219	10,056	1,558	3,665	....	....	35,955	323,820	....	Iowa
2,782	819	3,861	1,750	3,408	....	133	78,948	777,497	....	Missouri
3,537	1,815	1,612	585	....	....	1,148	24,222	949,842	....	Wisconsin
1,528	715	597	1,416	665	711	11,155	151,976	2,067,344	3,509	Michigan
2,342	921	4,652	945	53,275	3,051	....	182,791	2,930,038	5,699	Illinois
1,447	633	3,347	1,118	15,840	3,196	....	96,962	1,136,463	991	Indiana
1,773	818	2,778	2,536	23,550	6,541	....	220,061	2,889,804	6,519	Ohio

ABOUT THE WESTERN STATES

Value of Crops (millions and tenths of million dollars)	Total Value of Fisheries (thousand dollars)	Sheep (thousands)	All Cattle Including Milk Cows (thousands)	Milk Cows (thousands)	Copper (thousand pounds)	Petroleum (thousand barrels)	Total Value of Minerals (thousand dollars)	Total Value Added by Manufacturing (thousand dollars)	Western States
144.8	9,563	1,143	625	244	1,405	....	22,435	367,149	Washington
89.4	2,605	3,319	805	206	230	....	6,877	206,542	Oregon
537.5	12,871	4,084	2,103	574	26,262	228,099	554,916	1,349,191	California
104.0	....	3,302	622	158	2,714	....	32,143	44,448	Idaho
8.7	....	1,202	308	18	87,475	....	36,776	8,065	Nevada
35.3	....	2,922	442	96	205,770	....	115,131	56,727	Utah
87.6	....	4,027	1,290	151	198,796	3,139	93,842	61,249	Montana
29.4	....	3,417	824	58	29	17,846	51,237	33,628	Wyoming
124.8	....	2,505	1,454	219	12,944	1,657	55,332	122,331	Colorado
32.4	....	1,340	695	33	570,897	....	157,960	32,289	Arizona
34.6	....	2,291	1,055	57	74,188	10,172	37,128	11,278	New Mexico

VI. SOME IMPORTANT FIGURE FACTS

Northeastern States	Rural Population (thousands)	Per Cent People in Cities	Per Cent Area in Crops	Wheat (thousand bushels)	Potatoes (thousand bushels)	Value of Crops (thousand dollars)	Total Value of Fisheries (thousand dollars)
Maine	476	40.3	7.3	39	47,442	77.1	4,897
New Hampshire	192	58.7	7.3	....	1,030	9.8	52
Vermont	241	33.0	19.3	13	1,728	23.7	....
Massachusetts	418	90.2	10.9	4	992	30.5	18,053
Connecticut	475	70.4	13.9	4	1,133	28.2	3,636
Rhode Island	52	92.4	10.0	....	237	3.0	2,435
New York	2,066	83.6	26.7	3,818	21,445	197.5	5,267
Pennsylvania	3,098	67.8	27.2	17,411	20,756	197.3	172
New Jersey	702	82.6	20.5	1,101	4,734	52.4	8,731

VII. POPULATION OF SOME OF OUR STATES AND

	1930	1920	1910	1900	1890	1880	1870
Vermont	359,611	352,428	355,956	343,641	332,422	332,286	330,551
Ohio	6,646,697	5,759,394	4,767,121	4,157,545	3,672,329	3,198,060	2,665,260
Illinois	7,630,654	6,485,280	5,638,591	4,821,550	3,826,352	3,077,871	2,539,891
Iowa	2,470,939	2,404,021	2,224,771	2,231,853	1,912,297	1,624,615	1,194,020
Kansas	1,880,999	1,769,257	1,690,949	1,470,495	1,428,108	996,096	364,399
North and South Dakota	1,373,794	1,283,419	1,160,944	720,716	539,583	135,177	14,181
Colorado	1,035,791	939,629	799,024	539,700	413,249	194,327	39,864
California	5,677,251	3,426,861	2,377,549	1,485,053	1,213,398	864,694	560,247
Georgia	2,908,506	2,895,832	2,609,121	2,216,331	1,837,353	1,542,180	1,184,109
Alabama	2,646,248	2,348,174	2,138,093	1,828,697	1,513,401	1,262,505	996,992
Mississippi	2,009,821	1,790,618	1,797,114	1,551,270	1,289,600	1,131,597	827,922
Boston	781,188	748,060	670,585	560,892	448,477	362,839	250,526
New York City	6,930,446	5,620,048	4,766,883	3,437,202	2,507,414	1,911,698	1,478,103
Philadelphia	1,950,961	1,823,779	1,549,008	1,293,697	1,046,964	847,170	674,022
Baltimore	804,874	733,826	558,485	508,957	434,439	332,313	267,354
New Orleans	458,762	387,219	339,075	287,104	242,039	216,090	191,418
Chicago	3,376,438	2,701,705	2,185,283	1,698,575	1,099,850	503,185	298,977
Denver	287,861	256,491	213,381	133,859	106,713	35,629	4,759
San Francisco	634,394	506,676	416,912	342,782	298,997	233,959	149,473
Los Angeles	1,238,048	576,673	319,198	102,479	50,395	11,183	5,728
Detroit	1,568,662	993,678	465,766	285,704	205,876	116,340	79,577

VIII. IMPORTANT CITIES OF CANADA, MEXICO, CENTRAL AND SOUTH AMERICA, AND THE WEST INDIES

Capital cities are marked with an asterisk (*).

*Asuncion	Paraguay	142,300
Barranquilla	Colombia	139,974
Belem	Brazil	279,491
*Belize	British Honduras	12,661
Bello Horizonte	Brazil	108,849
*Bogotá	Colombia	235,421
*Buenos Aires	Argentina	2,116,284
Calgary	Alberta, Canada	102,470
Cali	Colombia	122,487
*Caracas	Venezuela	135,253
*Cayenne	French Guiana	13,936
Cordoba	Argentina	239,600
Curitiba	Brazil	100,135
Fortaleza (Ceara)	Brazil	123,706
Guadalajara	Mexico	143,376
*Guatemala	Guatemala	120,707
Guayaquil	Ecuador	100,000
*Georgetown	British Guiana	57,560
*Habana	Cuba	581,076
Hamilton	Ontario, Canada	134,566
Kingston	Jamaica	62,707
*La Paz	Bolivia	146,930
La Plata	Argentina	165,813
*Lima	Peru	265,000
Maceio	Brazil	103,930
Managua	Nicaragua	32,536
Medellin	Chile	120,044
*Mexico City	Mexico	968,443
*Montevideo	Uruguay	468,634
Montreal	Quebec, Canada	1,098,409
Nictheroy	Brazil	108,233
*Ottawa	Ontario, Canada	165,987
*Panama	Panama	60,000
*Paramaribo	Dutch Guiana	46,953
*Port-au-Prince	Haiti	100,000
Porto Alegre	Brazil	273,376
Quebec	Canada	135,000
*Quito	Ecuador	82,000
Recife	Brazil	340,543
Rosario	Argentina	265,000
*Rio de Janeiro	Brazil	1,468,621
*San José	Costa Rica	51,459
*San Salvador	Salvador	95,692
São Salvador	Brazil	328,898
Santiago	Chile	538,144
*Santo Domingo	Dominican Republic	30,957
Sao Paulo	Brazil	879,788
Sucre	Bolivia	34,577
*Tegucigalpa	Honduras	40,049
Toronto	Canada	690,645
*Valparaiso	Chile	191,494
Vancouver	Canada	277,631
Winnipeg	Canada	336,202

ABOUT THE NORTHEASTERN STATES

All Cattle including Milk Cows (thousands)	Milk Cows (thousands)	Pig Iron shipped from blast furnaces (thousand tons)	Total Value of Minerals (thousand dollars)	Total Value Added by Manufacturing (thousand dollars)	Cotton Spindles (thousands)	Cotton Looms	Pulp Wood (thousand tons)	Northeastern States
257	125	....	6,749	174,385	1,036	....	981	Maine
136	69	....	3,726	147,132	1,302	26,605	213	New Hampshire
472	255	....	14,603	77,260	....	....	26	Vermont
207	119	....	16,031	1,710,729	7,828	136,444	....	Massachusetts
167	94	....	7,053	806,214	1,090	19,068	....	Connecticut
32	19	....	940	324,078	2,105	40,127	....	Rhode Island
2,220	1,173	1,638	109,361	4,973,920	696	9,894	663	New York
1,511	761	9,735	892,914	3,430,606	98	8,420	213	Pennsylvania
175	105	....	71,892	1,771,430	371	4,118	....	New Jersey

CITIES FROM 1790 DOWN TO THE PRESENT TIME

1860	1850	1840	1830	1820	1810	1800	1790	
315,098	314,120	291,948	280,652	235,981	217,895	154,465	85,425	Vermont
2,339,511	1,980,329	1,519,467	937,903	581,434	230,760	45,365	....	Ohio
1,711,951	851,470	476,183	157,445	55,211	12,282	....	....	Illinois
674,913	192,214	43,112	....	....	....	....	....	Iowa
107,206	....	....	....	....	....	....	....	Kansas
4,837	....	....	....	....	....	....	....	North and South Dakota
34,277	....	....	....	....	....	....	....	Colorado
379,994	92,597	....	....	....	....	....	....	California
1,057,286	906,185	691,392	516,823	340,989	252,433	162,686	82,548	Georgia
964,201	771,623	590,756	309,527	127,901	....	....	....	Alabama
791,305	606,526	375,651	136,621	75,448	40,352	8,850	....	Mississippi
177,840	136,881	93,383	61,392	43,298	33,787	24,937	18,320	Boston
1,174,779	696,115	391,114	242,278	152,056	119,734	79,216	49,401	New York City
565,529	121,376	93,665	80,462	63,802	53,722	41,220	28,522	Philadelphia
212,418	169,054	102,313	80,620	62,738	46,555	26,514	13,503	Baltimore
168,675	116,375	102,193	46,082	27,176	17,242	....	....	New Orleans
109,260	29,963	4,470	....	....	....	....	....	Chicago
....	....	....	....	....	....	....	....	Denver
56,802	34,776	....	....	....	....	....	....	San Francisco
4,385	1,610	....	....	....	....	....	....	Los Angeles
45,619	21,019	9,102	2,222	1,422	....	....	....	Detroit

IX. CITIES IN THE UNITED STATES, 120,000 AND OVER

City	Population, 1930	City	Population, 1930	City	Population, 1930
New York, N. Y.	6,930,446	Jersey City, N. J.	316,715	Youngstown, Ohio	170,002
Chicago, Ill.	3,376,438	Louisville, Ky.	307,745	Grand Rapids, Mich.	168,592
Philadelphia, Pa.	1,950,961	Portland, Ore.	301,815	Hartford, Conn.	164,072
Detroit, Mich.	1,568,662	Houston, Tex.	292,352	Fort Worth, Tex.	163,447
Los Angeles, Calif.	1,238,048	Toledo, Ohio	290,718	New Haven, Conn.	162,655
Cleveland, Ohio	900,429	Columbus, Ohio	290,564	Flint, Mich.	156,492
St. Louis, Mo.	821,960	Denver, Colo.	287,861	Nashville, Tenn.	153,866
Baltimore, Md.	804,874	Oakland, Calif.	284,063	Springfield, Mass.	149,900
Boston, Mass.	781,188	St. Paul, Minn.	271,606	San Diego, Calif.	147,995
Pittsburgh, Pa.	669,817	Atlanta, Ga.	270,366	Bridgeport, Conn.	146,716
San Francisco, Calif.	634,394	Dallas, Tex.	260,475	Scranton, Pa.	143,433
Milwaukee, Wis.	578,249	Birmingham, Ala.	259,678	Des Moines, Iowa	142,559
Buffalo, N. Y.	573,076	Akron, Ohio	255,040	Long Beach, Calif.	142,032
Washington, D. C.	486,869	Memphis, Tenn.	253,143	Tulsa, Okla.	141,258
Minneapolis, Minn.	464,356	Providence, R. I.	252,981	Salt Lake City, Utah	140,267
New Orleans, La.	458,762	San Antonio, Tex.	231,542	Paterson, N. J.	138,513
Cincinnati, Ohio	451,160	Omaha, Nebr.	214,006	Yonkers, N. Y.	134,646
Newark, N. J.	442,337	Syracuse, N. Y.	209,326	Norfolk, Va.	129,710
Kansas City, Mo.	399,746	Dayton, Ohio	200,982	Jacksonville, Fla.	129,549
Seattle, Wash.	365,583	Worcester, Mass.	195,311	Albany, N. Y.	127,412
Indianapolis, Ind.	364,161	Oklahoma City, Okla.	185,389	Trenton, N. J.	123,356
Rochester, N. Y.	328,132	Richmond, Va.	182,929	Kansas City, Kans.	121,857

X. AREA AND POPULATION OF THE STATES OF THE UNITED STATES, THE OCCUPATIONS OF THEIR PEOPLE, AND THE VALUE OF THEIR CROPS AND MANUFACTURED PRODUCTS. Dates of admission to the Union are given in the first column. Value of all farm crops expressed in millions of dollars. Amounts of $500,000 and over are counted as $1,000,000.

State	Land Area, Sq. Miles, 1930	Population per Sq. Mile in 1930	Population in 1930, in Thousands	Population in 1920, in Thousands	Distribution of Persons Over 10 Years of Age in Gainful Occupations				[2]Value of All Farm Crops (Million Dollars)	Value of Manufactured Products (Million Dollars)
					Total Persons Occupied, in Thousands	Percentage of Total for Each Occupational Class				
						Agriculture, Forestry, Fishing, and Animal Husbandry	Manufacturing and Mechanical Industries	Extraction of Minerals		
Alabama (1819)	51,279	51.6	2,646	2,348	1,026	49	18	3	252	560.4
Arizona (1912)	113,810	3.8	436	334	165	24	17	11	43	200.0
Arkansas (1836)	52,525	35.3	1,854	1,752	668	57	11	1	254	210.9
California (1850)	155,652	36.5	5,677	3,427	2,501	14	25	2	735	3,103.3
Colorado (1876)	103,658	10.0	1,036	940	403	27	17	5	159	306.1
Connecticut (1789)	4,820	333.4	1,607	1,381	677	6	50	..	65	1,471.9
Delaware (1789)	1,965	121.3	238	223	98	18	36	..	27	149.6
District of Columbia[1]	62	7,852.7	487	438	244	..	17	..	1	89.0
Florida (1845)	54,861	26.8	1,468	968	599	25	21	..	111	232.4
Georgia (1789))	58,725	49.5	2,909	2,896	1,162	43	20	..	279	722.5
Idaho (1890)	83,354	5.3	455.	432	162	32	13	4	134	96.4
Illinois (1818)	56,043	136.2	7,631	6,485	3,185	11	34	2	559	6,282.1
Indiana (1816)	36,045	89.8	3,239	2,930	1,251	20	35	2	319	2,539.9
Iowa (1846)	55,586	44.5	2,471	2,404	913	36	17	1	656	898.2
Kansas (1861)	81,774	23.0	1,881	1,769	694	33	16	3	405	751.6
Kentucky (1792)	40,181	65.1	2,615	2,417	907	40	17	7	240	502.6
Louisiana (1812)	45,409	46.3	2,102	1,799	816	38	18	1	173	685.0
Maine (1820)	29,895	26.7	797	768	309	20	33	1	110	391.8
Maryland (1789)	9,941	164.1	1,632	1,450	673	13	33	1	107	1,119.1
Massachusetts (1789)	8,039	528.6	4,250	3,852	1,814	4	46	..	84	3,392.2
Michigan (1837)	57,480	84.2	4,842	3,668	1,927	14	43	1	309	4,656.7
Minnesota (1858)	80,858	31.7	2,564	2,387	993	31	20	1	496	1,173.2
Mississippi (1817)	46,362	43.4	2,010	1,791	845	67	9	..	314	220.9
Missouri (1821)	68,727	52.8	3,629	3,404	1,458	26	25	1	359	1,917.2
Montana (1889)	146,131	3.7	538	549	216	38	12	8	117	271.1
Nebraska (1867)	76,808	17.9	1,378	1,296	507	39	14	..	379	484.2
Nevada (1864)	109,821	0.8	91	77	43	21	13	14	14	33.7
New Hampshire (1789)	9,031	51.5	465	443	193	13	46	..	31	332.5
New Jersey (1789)	7,514	537.8	4,041	3,156	1,712	4	43	..	110	3,937.2
New Mexico (1912)	122,503	3.5	423	360	143	42	11	6	45	21.7
New York (1789)	47,654	264.2	12,588	10,385	5,523	5	36	..	461	6,554.3
North Carolina (1789)	48,740	65.0	3,170	2,559	1,141	45	25	..	312	1,311.9
North Dakota (1889)	70,183	9.7	681	647	240	56	7	..	225	55.3
Ohio (1803)	40,740	163.1	6,647	5,759	2,616	12	40	2	409	6,027.9
Oklahoma (1907)	69,414	34.5	2,396	2,028	828	37	14	7	318	455.9
Oregon (1859)	95,607	10.0	954	783	410	25	24	1	136	411.8
Pennsylvania (1789)	44,832	214.8	9,631	8,720	3,722	7	39	9	397	7,443.9
Rhode Island (1789)	1,067	644.3	687	604	297	3	55	..	11	666.4
South Carolina (1789)	30,495	57.0	1,739	1,684	688	51	21	..	164	385.9
South Dakota (1889)	76,868	9.0	693	637	248	53	9	1	227	97.7
Tennessee (1796)	41,687	62.8	2,617	2,338	958	40	21	2	255	730.5
Texas (1845)	262,398	22.2	5,825	4,663	2,207	38	16	2	767	1,450.2
Utah (1896)	82,184	6.2	508	449	170	24	19	7	60	214.6
Vermont (1791)	9,124	39.4	360	352	141	28	28	2	63	143.5
Virginia (1789)	40,262	60.2	2,422	2,309	880	32	23	2	225	745.9
Washington (1889)	66,836	23.4	1,563	1,357	665	21	26	1	215	795.6
West Virginia (1863)	24,022	72.0	1,729	1,464	570	22	21	21	83	513.0
Wisconsin (1848)	55,256	53.2	2,939	2,632	1,130	26	33	..	517	2,156.7
Wyoming (1890)	97,548	2.3	226	194	92	34	12	9	45	96.3
United States (Continental)	2,973,776	41.3	122,775	105,711	48,830	28.4	24.47	4.3	11,775	67,110.7

[1] Federal District, created in 1791.
[2] Includes crops fed to animals.

XI. ELEVATION, LOCATION, AND POPULATION OF EACH CITY OF THE UNITED STATES AND ITS POSSESSIONS HAVING A POPULATION OF 20,000 OR OVER, INCLUDING THE CAPITAL AND LARGEST CITY OF EACH STATE. ELEVATIONS WERE KINDLY FURNISHED BY THE U. S. GEOLOGICAL SURVEY

	Alt.	N.°	W.°	1930	1920 (thous.)
Aberdeen, Wash	10	47.0	123.9	21,723	15
Abilene, Tex	1,719	32.5	99.9	23,175	10
Agana, Guam	25	13.5	144.7	8,690	7
Akron, Ohio	1,080	41.0	81.5	255,040	208
Alameda, Calif	262	37.7	122.7	35,033	29
Albany, N. Y	140	42.7	73.8	127,412	113
Albuquerque, N. M.	4,954	35.1	107.4	26,570	15
Alexandria, La	77	31.3	92.5	23,025	16
Alexandria, Va	33	38.8	77.0	24,149	18
Alhambra, Calif	456	34.1	118.1	29,472	9
Aliquippa, Pa	751	40.6	80.2	27,116	3
Allentown, Pa	321	40.6	75.5	92,563	74
Alliance, Ohio	1,040	40.9	81.1	23,047	22
Alton, Ill	578	38.8	90.1	30,151	25
Altoona, Pa	1,181	40.5	78.4	82,054	60
Amarillo, Tex	3,667	35.2	101.7	43,132	15
Ambridge, Pa	740	40.6	80.2	20,227	13
Amsterdam, N. Y.	276	42.9	74.1	34,817	34
Anderson, Ind	874	40.1	85.8	39,804	30
Annapolis, Md	23	38.9	76.6	12,531	11
Ann Arbor, Mich	843	42.3	83.7	26,944	20
Anniston, Ala	709	33.7	85.8	22,345	18
Ansonia, Conn	31	41.3	73.1	19,898	18
Appleton, Wis	790	44.3	88.4	25,267	20
Asheville, N. C	2,208	35.5	82.5	50,193	29
Ashtabula, Ohio	700	41.8	81.9	23,301	22
Ashland, Ky	537	38.5	82.7	29,074	15
Atlanta, Ga	1,050	33.7	84.4	270,366	201
Atlantic City, N. J.	10	39.4	74.4	66,198	51
Attleboro, Mass	137	41.9	71.3	21,769	20
Auburn, N.Y	709	42.9	76.5	36,652	36
Augusta, Ga	134	33.4	82.0	60,342	53
Augusta, Me	153	44.3	69.7	17,198	14
Aurora, Ill	647	41.7	88.2	46,589	36
Austin, Tex	502	30.1	92.7	53,120	35
Bakersfield, Calif	400	35.4	119.0	26,015	19
Baltimore, Md	70	39.3	76.6	804,874	734
Bangor, Me	24	44.8	68.8	28,749	26
Barberton, Ohio	968	41.0	81.5	23,934	19
Baton Rouge, La	60	30.4	91.1	30,729	22
Battle Creek, Mich.	824	42.2	85.2	43,573	36
Bay City, Mich	586	43.5	83.8	47,355	48
Bayonne, N. J	10	40.6	74.1	88,979	77
Beaumont, Tex	24	30.0	94.2	57,732	40
Belleville, Ill	480	38.5	90.0	28,425	25
Belleville, N. J	264	40.8	74.1	26,974	16
Bellingham, Wash	100	48.6	122.5	30,823	26
Beloit, Wis	743	42.5	89.0	23,611	21
Berkeley, Calif	600	37.8	122.3	82,109	56
Berlin, N. H	1,013	44.5	71.2	20,018	16
Berwyn, Ill	615	41.8	87.8	47,027	14
Bessemer, Ala	512	33.4	87.0	20,721	19
Bethlehem, Pa	300	40.6	75.4	57,892	50
Beverly, Mass	100	42.6	70.8	25,086	23
Binghamton, N. Y	866	42.1	75.9	76,662	67
Birmingham, Ala	610	35.5	86.8	259,678	179
Bismark, N. D	1,672	46.7	100.9	11,090	7
Bloomfield, N. J	182	40.7	74.2	38,077	22
Bloomington, Ill	830	40.5	89.0	30,930	29
Bluefield, W. Va	2,558	37.3	81.2	19,339	15
Boise, Idaho	2,700	43.6	116.3	21,544	21
Boston, Mass	100	42.3	71.1	781,188	748
Braddock, Pa	1,200	40.4	79.8	19,329	21
Bradford, Pa	859	42.0	78.7	19,306	16
Bridgeport, Conn	40	41.2	73.2	146,716	144
Bristol, Conn	400	41.6	72.9	28,451	21
Brockton, Mass	130	42.1	71.0	63,797	66

	Alt.	N.°	W.°	1930	1920 (thous.)
Brookline, Mass	200	42.3	71.1	47,490	38
Brownsville, Tex	33	25.9	97.4	22,021	12
Buffalo, N. Y	572	42.9	78.9	573,076	507
Burlington, Iowa	542	40.8	91.1	26,755	24
Burlington, Vt	109	44.5	73.3	24,789	23
Butler, Pa	1,077	40.8	79.8	23,568	24
Butte, Mont	5,769	46	112.5	39,532	42
Caguas, Puerto Rico	200	18.2	66.0	19,791	12
Cambridge, Mass	140	42.4	71.1	113,643	110
Camden, N. J	31	39.9	75.1	118,700	116
Canton, Ohio	1,080	40.7	81.4	104,906	87
Carbondale, Pa	1,069	41.6	75.5	20,061	19
Carson City, Nev	4,678	39.1	119.5	1,596	2
Cedar Rapids, Iowa	732	42.0	91.6	56,097	46
Central Falls, R. I.	100	41.9	71.4	25,898	24
Champaign, Ill	738	40.2	88.2	20,348	16
Charleston, S. C	15	32.8	80.0	62,265	68
Charleston, W. Va	601	38.4	81.7	60,408	40
Charlotte, N. C	759	35.2	80.8	82,675	46
Chattanooga, Tenn.	693	35.0	85.2	119,798	58
Chelsea, Mass	100	42.4	71.0	45,816	43
Chester, Pa	40	39.8	75.4	59,164	58
Cheyenne, Wyo	6,060	41.2	104.8	17,361	14
Chicago, Ill	598	41.8	87.6	3,376,438	2,702
Chicago Heights, Ill	684	41.5	87.6	22,321	20
Chicopee, Mass	180	42.2	72.6	43,930	36
Cicero, Ill		41.8	87.7	66,602	45
Cincinnati, Ohio	553	39.1	84.5	451,160	401
Clarksburg, W. Va.	1,007	39.3	80.4	28,866	28
Cleveland, Ohio	669	41.4	81.8	900,429	797
Cleveland Heights, Ohio	900	41.5	81.7	50,945	15
Clifton, N. J	66	40.7	74.1	46,875	26
Clinton, Iowa	590	41.8	90.2	25,726	24
Cohoes, N. Y	192	42.7	73.8	23,226	23
Colorado Springs, Colo	5,982	38.8	104.8	33,237	30
Columbia, S. C	315	33.9	81.0	51,581	38
Columbus, Ga	250	32.4	84.9	43,131	31
Columbus, Ohio	780	40.0	83.0	290,564	237
Concord, N. H	228	43.2	71.6	25,228	22
Corpus Christi, Tex	35	27.8	97.4	27,741	11
Council Bluffs, Iowa	994	41.2	95.8	42,048	36
Covington, Ky	513	39.0	84.4	65,252	57
Cranston, R. I	80	41.8	71.4	42,911	29
Cumberland, Md	687	39.7	78.8	37,747	30
Cuyahoga Falls, Ohio	1,005	41.3	81.5	19,797	10
Dallas, Tex	434	32.6	96.8	260,475	159
Danbury, Conn	371	41.4	73.5	22,261	19
Danville, Ill	603	40.1	87.6	36,765	34
Danville, Va	408	36.5	79.4	22,247	22
Davenport, Iowa	592	41.5	90.6	60,751	57
Dayton, Ohio	743	39.7	84.2	200,982	153
Dearborn, Mich	604	42.3	83.2	50,358	2
Decatur, Ill	682	39.8	88.9	57,510	44
Denver, Colo	5,278	39.7	105.0	287,861	256
Des Moines, Iowa	807	41.5	93.5	142,559	126
Detroit, Mich	584	42.3	83.0	1,568,662	994
Dover, Del	34	39.1	75.6	4,800	4
Dubuque, Iowa	874	42.5	90.7	41,679	39
Duluth, Minn	606	46.9	92.4	101,463	99
Dunmore, Pa	1,000	41.4	75.6	22,627	20
Duquesne, Pa	935	40.4	79.8	21,396	19
Durham, N. C	405	36.0	79.0	52,037	22
East Chicago, Ind	581	41.6	87.5	57,784	36

CITIES OF THE UNITED STATES AND ITS POSSESSIONS, ETC. (Continued)

	Alt.	N.°	W.°	1930	1920 (thous.)
East Cleveland, O..	660	41.4	81.5	39,667	27
East Liverpool, O..	731	40.6	81.0	23,329	21
Easton, Pa.........	364	40.7	75.3	34,468	34
East Orange, N. J..	182	40.7	74.2	68,020	51
E. Providence, R. I.	100	41.8	71.4	29,995	22
East St. Louis, Ill...	414	38.6	90.1	74,347	67
Eau Claire, Wis....	797	44.8	91.5	26,287	21
Elgin, Ill..........	745	42.0	88.2	35,929	27
Elizabeth, N. J.....	38	40.5	74.3	114,589	96
Elkhart, Ind.......	754	41.8	86.1	32,949	24
Elmira, N. Y.......	859	42.1	76.8	47,397	45
El Paso, Tex.......	3,710	31.7	105.9	102,421	78
Elyria, Ohio.......	721	41.3	82.1	25,633	20
Enid, Okla......	1,247	36.5	97.9	26,399	17
Erie, Pa...........	800	42.1	80.2	115,967	93
Evanston, Ill......	602	42.0	87.6	63,338	37
Evansville, Ind.....	394	38.0	87.5	102,249	85
Everett, Mass......	100	42.4	71.1	48,424	40
Everett, Wash.....	150	42.4	122.3	30,567	28
Fairmont, W. Va...	883	39.5	80.2	23,159	18
Fall River, Mass...	200	42.7	71.1	115,274	120
Fargo, N. D.......	906	46.9	96.9	28,619	22
Ferndale, Mich.....	640	42.5	83.2	20,855	3
Findlay, Ohio......	780	41.0	83.6	19,363	17
Fitchburg, Mass....	600	42.6	71.8	40,692	41
Flint, Mich........	733	43.0	83.6	156,492	92
Fond du Lac, Wis..	764	43.8	88.4	26,449	23
Fort Dodge, Iowa..	1,011	42.5	94.2	21,895	19
Fort Smith, Ark....	448	35.4	94.5	31,429	29
Fort Wayne, Ind...	780	41.1	85.1	114,946	87
Fort Worth, Tex...	619	32.7	97.2	163,447	106
Framingham, Mass.	199	42.3	71.5	22,210	17
Frankfort, Ky.....	511	38.1	84.5	11,626	10
Freeport, Ill.......	780	42.3	89.6	22.045	20
Fresno, Calif.......	290	36.7	119.7	52,513	45
Gadsden, Ala......	555	34.0	86.0	24,042	15
Galesburg, Ill......	789	40.9	90.4	28,830	24
Galveston, Tex.....	10	29.3	94.9	52,938	44
Gardner, Mass.....	1,030	42.6	72.0	19,399	17
Garfield, N. J......	60	40.9	74.1	29,739	19
Gary, Ind.........	581	41.5	87.5	100,426	55
Glendale, Calif.....	537	34.2	118.3	62,736	14
Gloucester, Mass...	80	42.6	70.6	24,204	23
Gloversville, N. Y..	798	43.0	74.3	23,099	22
Grand Rapids, Mich.	654	43.0	85.6	168,592	138
Granite City, Ill....	429	38.7	90.1	25,130	15
Great Falls, Mont..	3,332	47.2	111.4	28,822	24
Green Bay, Wis....	591	44.5	88.0	37,415	31
Greensboro, N. C...	836	36.1	79.8	35,569	20
Greenville, S. C....	970	34.8	82.4	29,154	23
Hackensack, N. J...	14	40.9	74.1	24,568	18
Hagerstown, Md...	522	39.6	77.7	30,861	28
Hamilton, Ohio....	605	39.3	84.5	52,176	40
Hammond, Ind....	590	41.6	87.5	64,560	36
Hamtramck, Mich..	630	42.3	83.0	56,268	49
Hannibal, Mo......	489	39.7	91.4	22,761	19
Harrisburg, Pa.....	357	40.2	76.9	80,339	76
Hartford, Conn....	40	41.8	72.7	164,072	138
Haverhill, Mass....	100	42.7	71.0	48,710	54
Hazleton, Pa.......	1,600	41.0	76.0	36,765	32
Helena, Mont......	4,111	46.5	112.0	11,803	12
Highland Park, Mich...........	639	42.3	83.1	52,959	46
High Point, N. C...	937	35.9	80.0	36,745	14
Hilo, Hawaii.......	50	19.7	155.1	19,468	10
Hoboken, N. J.....	260	40.7	74.0	59,261	68
Holyoke, Mass.....	200	42.2	72.6	56,537	60
Homestead, Pa.....	761	40.4	79.9	20,141	20
Honolulu, Hawaii..	10	21.4	157.9	137,582	83
Hot Springs, Ark...	579	34.3	93.1	20.238	12
Houston, Tex......	61	29.7	95.5	292,352	138
Huntington, W. Va.	564	38.5	82.5	75,572	50
Huntington Park, Calif............	160	34.0	118.2	24,591	5
Hutchinson, Kans..	1,530	38.0	97.9	27,085	23
Indianapolis, Ind...	720	39.7	85.1	364,161	314
Inglewood, Calif....	116	34.0	118.4	19,480	3
Irvington, N. J.....	160	40.7	74.2	56,733	25
Ithaca, N. Y.......	815	42.4	76.5	20,708	17
Jackson, Mich.....	947	42.4	84.4	55,187	48
Jackson, Miss......	297	32.2	90.0	48,282	23
Jackson, Tenn.....	425	35.7	88.8	22,172	19
Jacksonville, Fla...	11	29.6	81.6	129,549	92
Jamestown, N. Y...	1,311	42.1	79.2	45,155	39
Janesville, Wis.....	803	42.7	89.0	21,628	18
Jefferson City, Mo..	627	38.5	92.1	21,596	14
Jersey City, N. J...	101	40.7	74.1	316,715	298
Johnson City, Tenn.	1,631	36.3	82.4	25,080	12
Johnstown, Pa.....	1,180	40.3	79.0	66,993	67
Joliet, Ill..........	545	41.5	88.1	42,993	38
Joplin, Mo........	1,008	37.0	94.5	33,454	30
Juneau, Alaska.....	10	58.4	134.5	4,043	3
Kalamazoo, Mich ..	793	42.3	85.5	54,786	48
Kankakee, Ill......	628	41.1	87.9	20,620	17
Kansas City, Kans.	753	39.1	94.7	121,857	101
Kansas City, Mo...	766	39.1	94.6	399,746	324
Kearny, N. J......	111	40.7	74.2	40,716	27
Kenosha, Wis......	607	42.6	88.8	50,262	40
Kingston, N. Y....	224	41.9	74.0	28,088	27
Kingston, Pa......	545	41.3	75.9	21,600	9
Knoxville, Tenn....	932	35.9	84.0	105,802	78
Kokomo, Ind......	813	40.5	86.2	32,843	30
Lackawanna, N. Y.	600	42.8	78.9	23,948	18
La Crosse, Wis.....	580	43.8	91.1	39,614	30
Lafayette, Ind.....	594	40.4	86.9	26,240	22
La Grange, Ga.....	789	33.0	85.0	20,131	17
Lakewood, Ohio....	...	41.4	81.8	70,509	42
Lancaster, Pa......	367	40.0	76.3	59,949	53
Lansing, Mich.....	844	42.6	84.5	78,397	57
Laredo, Tex.......	438	27.4	99.5	32,618	23
Lawrence, Mass....	100	42.7	71.1	85,068	94
Lebanon, Pa.......	474	40.4	76.5	25,561	25
Leominster, Mass...	404	42.5	71.7	21,810	20
Lewiston, Me......	196	44.1	70.2	34,948	32
Lexington, Ky.....	947	38.0	84.3	45,736	42
Lima, Ohio.......	877	40.7	84.1	42,287	41
Lincoln, Neb.......	1,140	40.7	96.6	75,933	55
Linden, N. J.......	26	40.6	74.3	21,206	..
Little Rock, Ark...	288	34.7	92.2	81,679	65
Lockport, N. Y....	570	43.2	78.7	23,160	21
Long Beach, Calif..	10	33.8	118.1	142,032	56
Lorain, Ohio.......	959	14.4	82.2	44,512	37
Los Angeles, Calif..	339	34.0	118.2	1,238,048	577
Louisville, Ky.....	463	38.2	85.5	307,745	235
Lowell, Mass......	140	42.6	71.4	100,234	113
Lubbock, Tex......	...	33.6	101.8	20,520	4
Lynchburg, Va.....	531	37.4	79.2	40,661	30
Lynn, Mass.......	160	42.4	70.9	102,320	99
McKeesport, Pa....	750	40.4	79.8	54,632	47
Macon, Ga........	334	32.8	83.6	53,829	53
Madison, Wis......	924	43.0	89.4	57,899	38
Malden, Mass.....	100	42.4	71.1	58,036	49
Manchester, N. H..	224	43.0	71.5	76,834	78
Manila, P. I.......	10	14.6	121.0	328,650	284
Manitowoc, Wis....	592	44.1	87.7	22,963	18
Mansfield, Ohio....	1,237	40.8	82.5	33,525	28
Marion, Ind.......	810	40.5	85.7	24,496	24
Marion, Ohio......	986	40.5	83.1	31,084	28
Mason, Iowa.......	1,126	43.1	93.1	23,304	20
Massillon, Ohio....	939	40.8	81.4	26,400	17

CITIES OF THE UNITED STATES AND ITS POSSESSIONS, ETC. (Continued)

	Alt.	N.°	W.°	1930	1920 (thous.)
Mayaguez, Puerto Rico	25	18.2	67.2	37,060	19
Maywood, Ill.	632	41.9	87.7	25,829	12
Medford, Mass.	20	42.4	71.1	59,714	39
Melrose, Mass.	59	42.4	71.1	23,170	18
Memphis, Tenn.	274	35.2	90.0	253,143	162
Meriden, Conn.	150	40.6	86.2	38,481	30
Meridian, Miss.	344	32.2	88.5	31,954	23
Miami, Fla.	15	25.8	80.2	110,637	30
Michigan City, Ind.	597	41.7	86.9	26,735	19
Middletown, Conn.	40	41.6	72.6	24,554	14
Middletown, N. Y.	562	41.4	74.4	21,276	18
Middletown, Ohio	653	39.5	84.3	29,992	24
Milwaukee, Wis.	636	43.0	87.9	578,249	457
Minneapolis, Minn.	847	45.0	93.1	464,356	381
Mishawaka, Ind.	747	41.7	86.2	28,630	15
Mobile, Ala.	15	30.6	88.0	68,202	61
Moline, Ill.	574	41.4	90.5	32,236	31
Monessen, Pa.	762	40.1	79.9	20,268	18
Monroe, La.	77	32.5	92.1	26,028	13
Montclair, N. J.	241	40.8	74.2	42,017	29
Montgomery, Ala.	160	32.4	86.3	66,079	43
Montpelier, Vt.	523	44.2	72.6	7,837	7
Mt. Vernon, N. Y.	180	40.9	73.8	61,499	43
Muncie, Ind.	948	40.2	85.3	46,548	37
Muskegon, Mich.	589	43.2	86.1	41,390	37
Muskogee, Okla.	612	35.7	95.3	32,026	30
Nanticoke, Pa.	560	41.3	76.1	26,043	23
Nashua, N. H.	168	43.8	71.5	31,463	28
Nashville, Tenn.	497	36.0	86.8	153,866	118
New Albany, Ind.	464	38.2	85.8	25,819	23
Newark, N. J.	235	40.7	74.1	442,337	415
Newark, Ohio	836	40.0	82.5	30,596	27
New Bedford, Mass.	100	41.6	70.9	112,597	121
New Britain, Conn.	300	41.7	72.8	68,128	59
New Brunswick, N.J.	71	40.5	74.5	34,555	33
Newburgh, N. Y.	94	41.5	74.0	31,275	30
New Castle, Pa.	806	41.0	80.2	48,674	45
New Haven, Conn.	40	41.2	72.9	162,655	163
New London, Conn.	100	41.3	72.1	29,640	26
New Orleans, La.	5	29.9	90.1	458,762	387
Newport, Ky.	512	39.0	84.3	29,744	29
Newport, R. I.	100	41.5	71.2	27,612	30
Newport News, Va.	22	36.9	76.5	34,417	36
New Rochelle, N. Y.	100	40.9	73.8	54,000	36
Newton, Mass.	80	42.3	71.2	65,276	46
New York, N. Y.	36	40.8	73.9	6,938,446	5,620
Niagara Falls, N. Y.	603	43.1	79.0	75,460	51
Norfolk, Va.	15	36.8	76.3	129,710	116
Norristown, Pa.	83	40.1	75.4	35,853	32
North Adams, Mass.	800	42.6	73.1	21,621	22
Northampton, Mass.	200	42.3	72.6	24,381	22
North Little Rock, Ark.	250	34.8	92.3	19,418	14
North Tonawanda, N. Y.	580	43.0	78.9	19,019	15
Norwalk, Conn.	100	41.4	73.4	36,019	28
Norwich, Conn.	200	41.5	72.1	23,021	22
Norwood, Ohio	600	39.2	84.5	33,411	25
Nutley, N. J.	99	40.8	74.2	20,572	9
Oakland, Calif.	10	37.7	122.2	284,063	216
Oak Park, Ill.	630	41.8	87.8	63,982	40
Ogden, Utah	4,300	41.2	112.0	40,272	33
Oil City, Pa.	1,009	41.4	79.8	22,075	21
Oklahoma City, Okla.	1,199	35.4	97.6	185,389	91
Olean, N. Y.	1,452	42.1	78.4	21,790	21
Olympia, Wash.	10	47.0	122.9	11,733	8
Omaha, Neb.	1,040	41.2	96.0	214,006	192
Orange, N. J.	220	40.7	74.3	35,399	33

	Alt.	N.°	W.°	1930	1920 (thous.)
Orlando, Fla.	111	28.6	81.4	27,330	9
Oshkosh, Wis.	755	44.0	88.5	40,108	33
Oswego, N. Y.	295	43.4	76.5	22,652	24
Ottumwa, Iowa	653	41.0	92.4	28,075	23
Owensboro, Ky.	393	57.9	87.1	22,765	17
Paducah, Ky.	326	37.0	88.6	33,541	25
Pago Pago, American Samoa	10	14.3	170.7	708	1
Parkersburg, W. Va.	615	39.3	81.6	29,623	20
Pasadena, Calif.	...	...	...	76,086	45
Passaic, N. J.	60	40.8	74.1	62,959	64
Paterson, N. J.	180	40.9	74.2	138,513	136
Pawtucket, R. I.	100	41.8	71.3	77,149	64
Peabody, Mass.	19	42.5	70.9	21,345	20
Pensacola, Fla.	39	30.3	87.1	31,579	31
Peoria, Ill.	465	40.6	89.7	104,969	76
Perth Amboy, N. J.	10	40.5	34.3	43,516	42
Petersburg, Va.	88	37.2	77.5	28,564	31
Philadelphia, Pa.	68	39.9	75.2	1,950,961	1,824
Phillipsburg, N. J.	218	40.7	75.2	19,255	17
Phoenix, Ariz.	1,090	33.4	112.0	48,118	29
Pierre, S. D.	1,490	44.3	100.4	3,659	3
Pine Bluff, Ark.	234	34.2	92.0	20,760	19
Pittsburgh, Pa.	758	40.5	80.0	669,817	588
Pittsfield, Mass.	1,000	42.4	73.2	49,677	42
Plainfield, N. J.	107	40.6	74.4	34,422	28
Pomona, Calif.	861	34.1	117.0	20,804	14
Ponce, Puerto Rico	30	18.0	66.6	53,430	42
Pontiac, Mich.	940	42.6	83.2	64,928	34
Port Arthur, Tex.	10	20.0	94.0	50,902	22
Port Chester, N. Y.	34	41.0	73.6	22,662	17
Port Huron, Mich.	589	43.0	82.5	31,361	26
Portland, Me.	66	43.7	70.2	70,810	69
Portland, Ore.	54	45.5	122.7	301,815	258
Portsmouth, Ohio	535	38.8	83.0	42,560	33
Portsmouth, Va.	80	36.8	76.4	45,704	54
Pottstown, Pa.	139	40.2	75.6	19,430	17
Pottsville, Pa.	900	40.6	76.2	24,300	22
Poughkeepsie, N. Y.	173	41.8	73.9	40,288	35
Providence, R. I.	10	41.8	71.4	252,981	238
Pueblo, Colo.	4,695	38.2	104.6	50,096	43
Quincy, Ill.	984	40.0	91.3	39,241	36
Quincy, Mass.	100	42.2	71.0	71,983	48
Racine, Wis.	626	42.7	87.9	67,542	59
Raleigh, N. C.	362	35.8	78.8	37,379	24
Reading, Pa.	264	40.3	76.0	111,171	108
Reno, Nev.	4,495	39.1	119.8	18,529	12
Revere, Mass.	180	42.4	71.0	35,680	29
Richmond, Calif.	10	37.9	122.4	20,093	17
Richmond, Ind.	939	39.9	84.9	32,493	27
Richmond, Va.	164	27.5	77.5	182,929	172
Riverside, Calif.	848	34.0	117.4	29,696	19
Roanoke, Va.	925	37.3	80.0	69,206	51
Rochester, Minn.	991	44.0	92.4	20,621	14
Rochester, N. Y.	512	43.2	77.5	328,132	296
Rockford, Ill.	729	42.2	89.0	85,864	66
Rock Island, Ill.	581	41.4	90.6	37,953	35
Rocky Mount, N. C.	129	35.9	77.8	21,412	13
Rome, Ga.	610	34.3	85.2	21,843	13
Rome, N. Y.	460	43.2	78.6	32,338	26
Royal Oak, Mich.	661	42.5	83.2	22,904	6
Sacramento, Calif.	31	38.5	121.5	93,750	66
Saginaw, Mich.	601	43.4	84.0	80,715	62
St. Cloud, Minn.	1,043	45.6	94.1	21,000	16
St. Joseph, Mo.	874	39.7	94.9	80,935	78
St. Louis, Mo.	415	38.5	90.2	821,960	773
St. Paul, Minn.	180	44.9	93.0	271,606	235
St. Petersburg, Fla.	20	27.8	82.6	40,425	14
St. Thomas, Virgin Islands	10	18.0	64.7	7,036	8

CITIES OF THE UNITED STATES AND ITS POSSESSIONS, ETC. (Continued)

	Alt.	N.°	W.°	1930	1920 (thous.)
Salem, Mass	100	42.5	70.9	43,353	43
Salem, Ore	171	44.9	123.0	26,266	18
Salina, Kans	1,226	38.8	97.6	20,155	15
Salt Lake City, Utah	4,760	40.7	112.0	140,267	118
San Angelo, Tex	1,847	31.5	100.4	25,308	10
San Antonio, Tex	661	29.4	98.5	231,542	161
San Bernardino, Calif	1,049	34.1	117.3	37,481	19
San Diego, Calif	300	32.7	117.1	147,995	74
Sandusky, Ohio	598	41.3	82.7	42,622	23
San Francisco, Calif.	900	37.8	122.4	634,394	507
San Jose, Calif	98	37.2	121.9	57,561	40
San Juan, Puerto Rico	10	18.5	66.1	114,715	71
Santa Ana, Calif	139	33.8	117.9	30,322	15
Santa Barbara, Calif	69	34.7	119.7	33,613	19
Santa Fe, N. Mex	6,850	35.6	106.0	11,176	7
Santa Monica, Calif.	79	34.0	118.2	37,146	15
Savannah, Ga	20	32.1	81.1	85,024	83
Schenectady, N. Y.	235	42.8	73.9	95,692	89
Scranton, Pa	744	41.4	75.7	143,433	138
Seattle, Wash	25	47.5	122.2	365,583	315
Sedalia, Mo	909	38.6	93.2	20,806	21
Shamokin, Pa	900	40.7	76.6	20,274	21
Sharon, Pa	356	41.2	80.6	25,908	22
Shawnee, Okla	1,042	35.3	96.9	23,283	15
Sheboygan, Wis	589	43.7	87.7	39,251	31
Shenandoah, Pa	1,300	40.8	76.3	21,782	25
Shreveport, La	204	32.4	93.8	76,655	44
Sioux City, Iowa	1,106	42.5	96.3	79,183	71
Sioux Falls, S. D	1,398	43.5	96.9	33,362	25
Somerville, Mass	100	42.4	71.0	103,908	93
South Bend, Ind	712	41.8	85.1	104,193	71
South Gate, Calif	125	34.0	118.1	19,632	...
Spartanburg, S. C	878	34.8	82.0	28,723	23
Spokane, Wash	1,889	47.6	117.6	115,514	104
Springfield, Ill	598	39.7	89.6	71,864	59
Springfield, Mass	180	42.1	72.5	149,900	130
Springfield, Mo	1,300	37.1	93.1	57,527	40
Springfield, Ohio	979	39.9	83.9	68,743	61
Stamford, Conn	40	41.0	73.5	46,346	35
Steubenville, Ohio	714	40.4	81.0	35,422	29
Stockton, Calif	18	37.9	121.2	47,963	40
Superior, Wis	650	46.7	92.1	36,113	40
Syracuse, N. Y	410	43.0	76.1	209,326	172
Tacoma, Wash	110	47.3	122.4	106,817	97
Tallahassee, Fla	215	30.3	84.3	10,700	6
Tampa, Fla	15	27.9	82.3	101,161	52
Taunton, Mass	80	41.9	71.1	37,355	37
Terre Haute, Ind	485	39.4	87.3	62,810	66
Toledo, Ohio	603	41.6	83.5	290,718	243
Topeka, Kans	928	39.0	95.6	64,120	50
Torrington, Conn	600	41.8	73.1	26,040	21
Trenton, N. J	60	40.2	74.9	123,356	119
Troy, N. Y	200	42.7	74.7	72,763	72
Tucson, Ariz	2,375	32.2	111.0	32,506	20
Tulsa, Okla	711	36.1	96.0	141,258	72
Tuscaloosa, Ala	172	33.2	87.6	20,659	12
Union City, N. J	104	40.6	74.3	58,659	...
Uniontown, Pa	980	39.9	79.8	19,544	16
University City, Mo.	500	38.7	90.3	25,809	7
Utica, N. Y	436	43.1	75.1	101,740	94
Vicksburg, Miss	201	32.3	90.9	22,943	18
Waco, Tex	396	31.5	97.2	52,848	39
Waltham, Mass	80	42.4	71.2	39,247	31
Warren, Ohio	880	41.2	80.9	41,062	27
Washington, D. C	90	38.9	77.0	486,869	438
Washington, Pa	1,156	40.2	80.2	24,545	21
Waterbury, Conn	500	41.5	73.1	99,902	92
Waterloo, Iowa	852	42.5	92.3	46,191	36
Watertown, Mass	80	42.2	71.1	34,913	21
Watertown, N. Y	478	44.0	75.9	32,205	31
Waukegan, Ill	664	42.4	87.8	33,499	19
Wausau, Wis	1,167	45.0	89.6	23,758	19
Wauwatosa, Wis	654	43.1	88.0	21,194	6
West Allis, Wis	700	43.0	88.0	34,671	14
Westfield, Mass	149	42.1	72.8	19,775	19
West New York, N.J.	10	40.7	74.0	37,107	30
West Orange, N. J	100	40.8	74.2	24,327	16
West Palm Beach, Fla	16	26.7	80.1	26,610	9
Wheeling, W. Va	678	41.0	80.9	61,659	56
White Plains, N. Y.	201	41.0	73.8	35,830	21
Wichita, Kans	1,295	37.7	97.2	111,110	72
Wichita Falls, Tex	951	33.7	98.4	43,690	40
Wilkes-Barre, Pa	580	41.3	76.0	86,626	74
Wilkinsburg, Pa	922	40.4	79.8	29,539	24
Williamsport, Pa	528	41.3	77.1	45,729	36
Wilmington, Del	100	39.7	75.6	106,597	110
Wilmington, N. C	...	...	...	32,270	33
Winona, Minn	666	44.0	91.6	20,850	19
Winston-Salem, N. C	884	36.1	80.3	75,274	48
Woburn, Mass	98	42.5	71.4	19,434	17
Woonsocket, R. I	140	42.0	71.5	49,376	43
Worcester, Mass	600	42.2	71.3	195,311	180
Wyandotte, Mich	585	42.2	83.2	28,368	14
Yakima, Wash	1,065	46.7	120.5	22,101	19
Yonkers, N. Y	300	40.9	73.8	134,646	100
York, Pa	371	39.9	76.6	55,254	48
Youngstown, Ohio	847	41.0	80.8	170,002	132
Zanesville, Ohio	726	31.9	82.0	36,440	30

XII. LUMBER PRODUCTION IN THE UNITED STATES

State	Billions of Board Feet		State	Billions of Board Feet		State	Billions of Board Feet	
	1899	1929		1899	1929		1899	1929
Maine	1	..	Michigan	3	1	Arkansas	2	1
New Hampshire	1	..	Minnesota	2	..	Louisiana	1	2
New York	1	..	Wisconsin	3	1	Texas	1	1
Pennsylvania	2	..	Virginia	1	1	Idaho	..	1
Ohio	1	..	North Carolina	1	1	Washington	1	7
Indiana	1	..	South Carolina	..	1	Oregon	1	5
Missouri	1	..	Georgia	1	1	California (includes Nevada)	1	2
West Virginia	1	1	Florida	1	1			
Kentucky	1	..	Alabama	1	2		—	—
Tennessee	1	1	Mississippi	1	3	Total United States.	35	37

XIII. THIS TABLE SHOWS HOW MUCH COAL OF DIFFERENT KINDS WE HAVE IN THE SEVERAL STATES AND IN THE UNITED STATES

States	Billion Tons				
	Anthracite	Semibituminous	Bituminous	Subbituminous	Lignite
Alabama	....	....	66.9	....	....
Arizona	....	....	....	1.1	....
Arkansas	0.2	1.1	0.2	....	....
Colorado	....	....	212.7	104.1	....
Georgia	....	0.9	....	....	....
Idaho	....	....	0.6	0.1	....
Illinois	....	....	198.8	....	....
Indiana	....	....	52.3	....	....
Iowa	....	....	28.8	....	....
Kansas	....	....	29.7	....	....
Kentucky	....	....	122.3	....	....
Maryland	....	6.2	1.5	....	....
Michigan	....	....	1.9	....	....
Missouri	....	....	83.8	....	....
Montana	....	....	2.6	62.9	315.5
New Mexico	....	....	18.8	1.9	....
North Dakota	....	....	....	....	600.0
Ohio	....	....	92.5	....	....
Oklahoma	....	8.0	46.8	....	....
Oregon	....	....	....	0.5	....
Pennsylvania	16.2	9.2	95.2	....	....
South Dakota	....	....	....	....	1.0
Tennessee	....	....	25.4	....	....
Texas	....	....	8.0	....	22.9
Utah	....	....	88.1	5.2	....
Virginia	0.5	0.3	20.5	....	....
Washington	....	....	11.3	52.4	....
West Virginia	....	29.2	120.4	....	....
Wyoming	....	....	30.4	590.0	....
Total United States	17.0	55.0	1,359.6	818.2	939.5

XIV. MAKING MODELS OF VILLAGES, FARMS, DWELLINGS, ETC.

Use a table top, large tray, or lid of pasteboard box for a foundation.

For *hills* and *mountains*, use clay or damp sand; stones are useful when piled up and covered with earth.

Make *trees* of branches of real trees, flower stalks, and crepe paper.

For *lakes* and *streams*, and other forms of water, use blue paper, water in a pan, pieces of a mirror, or window glass.

Roads, *paths*, use real dirt or sand, or brownish paper cut in the desired shape.

Snow can be made of cotton, and *grass* can be made of real sod, or of green paper; the paper cut into tiny shreds and sprinkled over sand.

For *houses* and other *buildings* the following materials will be useful: plasteline or clay; corrugated paper (it comes as a wrapping for books and parcels); bark; stone; cardboard or compoboard painted to be like brick; cardboard for shingle roof; hay or straw for a thatched roof.

For *people* and *animals*, use small dolls and toys, clothespins, or wire. Use wire and cotton and crepe paper to complete the figures. Or you may cut the figures from cardboard and paint them.

Figures may be made to stand if they are cut double, or they may be glued to pieces of wood.

Excellent models of continents or other land areas can be made of salt and flour.

For other suggestions about handwork consult any good activities handbook, one of which is *Industrial Arts for Elementary Schools*, by Bonser and Mossman.

It might be stimulating to get the pupils to work at devising new ways of reproducing models of the things about which they study. I once saw in a Philippine schoolroom a six-foot table on which the class was building a village and environs. As they studied home geography, they built, and it was a beautiful thing. I saw it at recess time, and the children were at work on it. It stood in a corner of the room and stayed there for weeks.

Such a table might show industry after industry, country after country, or type after type as the class advances.

XV. BOOKS THAT ENRICH THE STUDY OF GEOGRAPHY

For the Teacher

1. The Geographic News service of the National Geographic Society, Washington, D. C.
2. Smith, *North America;* Harcourt, Brace & Co.
3. Whitbeck, *South America;* McGraw-Hill Co.
4. Encyclopedia Britannica. Of interest for every country.
5. Winston's Cumulative Loose-Leaf Encyclopedia. Of interest for every country.

For the Pupil

1. Bass, *Stories of Pioneer Life;* Heath.
2. Beeby, *America's Roots in the Past;* Charles E. Merrill.
3. Beeby, *Community Life Today and in Colonial Times;* Charles E. Merrill.
4. Blaisdell and Ball, *Log Cabin Days;* Little, Brown.
5. Burnham, *The Story of America for Young Americans;* Winston.
6. Dickson, *Camp and Trail in Early American History;* Macmillan.
7. Dopp, *The Early Farmers;* Rand McNally.
8. Grolier Society, *The Book of Knowledge.*
9. Grolier Society, *Lands and Peoples.*
10. Heard and King, *Stories of American Pioneers;* Winston.
11. Heard and King, *Colonial Heroes;* Winston.
12. Hillyer, *A Child's History of the World;* Century.
13. Hillyer, *A Child's Geography of the World;* Century.
14. McDonald and Dalrymple, *Betty in Canada;* Little, Brown.
15. Mitchell, *Pas and Pablo;* World Book.
16. O'Brien, Jack, *Silver Chief, Dog of the North;* Winston.
17. Perkins, *The Mexican Twins;* Houghton Mifflin.
18. Rush, C. E., and Winslow, A., *Modern Aladdins and Their Magic;* Little, Brown & Co.

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Explanation of Symbols: Geographic and proper names are indexed in black-face type (**Aberdeen**), other subjects in light-face (abaca). Map references are given by italic figures in parentheses, with or without location, as (*452* R5) or (*460*). Illustrations are shown by italic figures with asterisk, as **81*. All references are to page numbers.

Key to Pronunciation: āte, senāte, râre, căt, locȧl, fär, ȧsk, pȧrade; scēne, ēvent, ĕdge, novĕl, refẽr; rīght, sĭn; cōld, ōbey, côrd, stŏp, cŏmpare; ūnit, ūnite, bûrn, cŭt, focŭs, menü; bōōt, fo͝ot; found; boil; function; **ch**ase; good; joy; *th*en, **th**ick; hw = wh as in when; zh = z as in azure; kh = ch as in loch.

VIRGINIA

LIFE, RESOURCES, AND INDUSTRIES *of the* OLD DOMINION

A Supplement to
HUMAN USE GEOGRAPHY

INTERNATIONAL PRESS

THE JOHN C. WINSTON COMPANY

CHICAGO ATLANTA
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Fig. A. An aerial view of Richmond showing the down-town business section of the city. Find the State Capitol, the building with pillars in the lower left center of the picture.

VIRGINIA

LIFE, RESOURCES, AND INDUSTRIES OF THE OLD DOMINION

UNIT I—THE STATE AS A WHOLE

Virginia—at tidewater on the Atlantic and Chesapeake Bay. As we study Virginia during this school year, we shall learn many reasons for the development of the Old Dominion since that May day, 1607, when three small ships landed 104 colonists on a low-lying, wooded peninsula within the capes of Chesapeake, thus beginning the permanent settlement of America by English-speaking peoples.

Location at tidewater is one of the most important of these reasons. Virginia faces the Atlantic—the busiest highway in the world. It fronts on a part of that ocean called Chesapeake Bay.

Chesapeake Bay is a large area of deep, quiet water. Here ships are safe from the storms of the open sea. Broad rivers (name them, Fig. 2–3-A) flow into the bay and form several *harbors*—places of shelter for ships. Men have built *ports;* that is, towns or cities by these harbors. Virginia is neighbor by way of the sea with all the nations of the world.

Just medium sized. Among such giant states as Texas and California, Virginia seems quite small. In fact, six states the size of Virginia could be fitted snugly within Texas with room to spare. On the other hand, eighteen states the size of Delaware, if placed on Virginia, would fail to cover completely the lands and waters of the Old Dominion. You see, therefore, that Virginia should be grouped neither with the largest nor the smallest states of the Union. It ranks thirty-third in size in the family of states.

If you like figures, you might remember that the area of Virginia is 42,627 square miles, 2365 square miles of which are water—bays, harbors, lakes, and rivers. This area is just a little larger than the country of Guatemala in Central America, or of Belgium, the Netherlands, and Denmark combined. The greatest distance north and south within the state is about 200 miles; the greatest width is 440 miles along the southern border.

Virginia's neighbors. On the south


VIRGINIA
SCALE OF STATUTE MILES
0 5 10 15 20 25 50 75
SCALE OF KILOMETERS
0 20 40 80 120
SOUTHWESTERN PART OF VIRGINIA
Same scale as main map
WEST VIRGINIA
OHIO
KY.
TENN.
NORTH C
L.L.POATES ENG'R.CO.,N.Y.
Longitude
West

Fig. A.

E
78°
F
77°
G
76°
H
P E N N S Y L V A N I A
Hollidaysburg
Huntingdon
Juniata R.
New Bloomfield
HARRISBURG
Lebanon
Reading
Schuylkill R.
Carlisle
Lancaster
Bedford
Susquehanna R.
York
Westchester
Media
McConnellsburg
Chambersburg
Gettysburg
Hagerstown
Westminster
Elkton
Wilmington
NEW JER.
Salem
Belair
Towson
Baltimore
Ellicott City
Chestertown
DOVER
Frederick
Shepherdstown
Harpers Ferry
Martinsburg
BERKELEY
JEFFERSON
Charles Town
Winchester
FREDERICK
HAMPSHIRE
CLARKE
Leesburg
LOUDOUN
Rockville
Potomac R.
Centreville
ANNAPOLIS
WASHINGTON
DIST. OF COLUMBIA
Alexandria
Upper Marlborough
Easton
Denton
Georgetown
FAIRFAX
FAUQUIER
Warrenton
PRINCE WILLIAM
SHENANDOAH
WARREN
RAPPAHANNOCK
PAGE
CULPEPER
MADISON
Prince Fredericktown
Cambridge
Salisbury
Leonardtown
Fredericksburg
STAFFORD
KING GEORGE
SPOTSYLVANIA
ORANGE
GREENE
Charlottesville
ALBEMARLE
LOUISA
CAROLINE
ESSEX
WESTMORELAND
RICHMOND
NORTHUMBERLAND
LANCASTER
Princess Anne
Snow Hill
Chincoteague Island
ACCOMAC
NORTHAMPTON
HANOVER
GOOCHLAND
RICHMOND
HENRICO
CHESTERFIELD
POWHATAN
BUCKINGHAM
Farmville
PRINCE EDWARD
AMELIA
Petersburg
PRINCE GEORGE
DINWIDDIE
NOTTOWAY
LUNENBURG
MECKLENBURG
BRUNSWICK
SUSSEX
SURRY
SOUTHAMPTON
Williamsburg
JAMES CITY
NEW KENT
GLOUCESTER
MATHEWS
Hampton
Newport News
Norfolk
Portsmouth
NANSEMOND
NORFOLK
PRINCESS ANNE
Dismal Swamp
C. Henry
Virginia Beach
ISLE OF WIGHT
Suffolk
Roanoke R.
A R O L I N A
Currituck
A T L A N T I C O C E A N
from Greenwich

Fig. A.

Fig. A. Tell what this picture shows.

Virginia is separated from North Carolina and Tennessee by an imaginary line, a part of the parallel 36° 30′ north latitude. To the west the state is separated from Kentucky and West Virginia by a very irregular line (Fig. 2-A). If you followed this line, you would walk along the crest of one mountain and then across to the crest of another, all the way from the western tip of the state where it meets Tennessee and Kentucky, to the gap which the Potomac has cut through the Alleghenies at Harpers Ferry. Where state or national highways crossed your path, you would see highway markers erected to tell the motorist the state which he was entering. For long distances between markers, however, you could not tell whether you were in Virginia, Kentucky, or West Virginia. Why would this be true also along our southern boundary?

To the north and east Virginia looks across the historic Potomac and the broad Chesapeake at its neighbor, Maryland. The river and the bay are natural boundaries.

A small piece of Virginia, however, is separated from Maryland by a man-made boundary, approximately the thirty-eighth parallel of north latitude. This part of the state, Accomac and Northampton counties, we call the Eastern Shore. The Indians called it *Accawmacke*—"land beyond the waters."

THINGS TO THINK ABOUT

1. In what zone is Virginia? what hemisphere? what group of states?
2. How does the population of Virginia compare with smaller areas such as Belgium or the Netherlands?
3. Why is tidewater frontage an advantage to any community?
4. What is a harbor? a port? Show your answer by a drawing and explain the drawing.
5. What boundaries of Virginia are natural boundaries? man-made boundaries? Which is the better kind of boundary for a state or country to have? why?
6. How would you describe the shape of Virginia in terms of some article of food which you like very much?

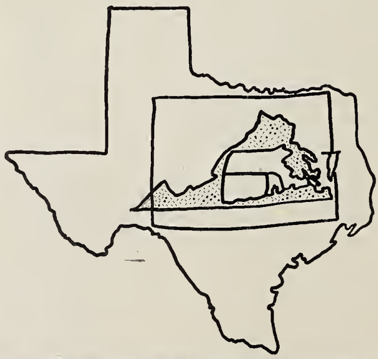


Fig. B. Relative size of Virginia as compared with Texas, and Massachusetts, Connecticut, and Rhode Island. Find the population of each of these states and tell whether or not you think that Virginia has a dense population.

THINGS TO TALK ABOUT

1. The sea highway and its sheltered bay within the capes of the Chesapeake.
2. A shipowner who docks at Norfolk in preference to New York City.

A PATTERN MAP

On page 48 of this book there is a pattern map of Virginia placed there for your convenience in sketching outline maps of the state.

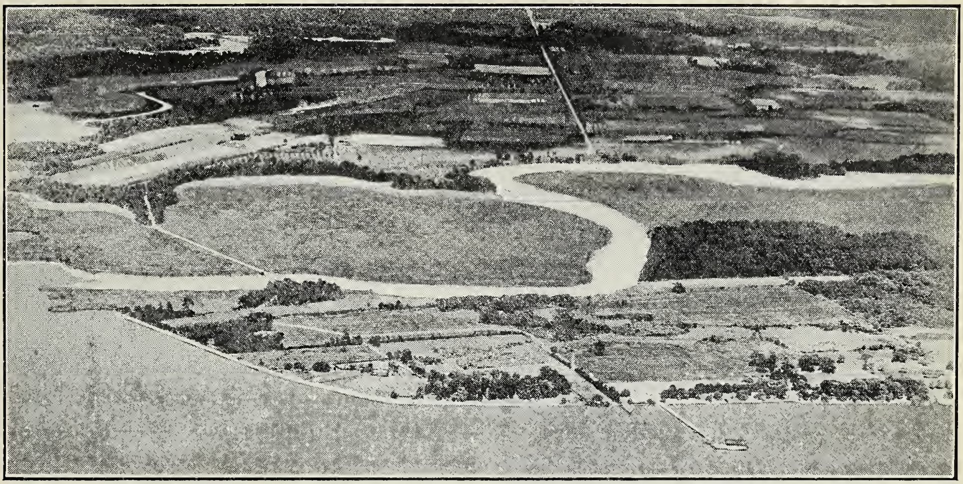


Fig. A. In the foreground of this picture, near the pier, is a monument. It marks the site of Jamestown. The picture also helps you to understand Tidewater Virginia—a low-lying district, wooded here and there, and with many tidal streams.

UNIT II—HOW VIRGINIA CAME TO BE A STATE

Jamestown. Virginia as we know it today is the remnant of a very much larger area named by Sir Walter Raleigh "Virginia," in honor of Queen Elizabeth of England, who was called "The Virgin Queen."

The first colonists at Jamestown were chiefly "gentlemen" unused to labor. They had heard wild tales about the glories of America: "All their pans are pure golde, and all the chaines with which they chaine up their streets are massive golde; and for rubies and diamonds they goes forth on holy days and gather them by the seashore."

The settlers did little else but search for gold or for passes through America to the Indies. As Captain John Smith exclaimed, "There was now no talk, no hope, no work, but dig gold, wash gold, refine gold, load gold."

Winter found them with no crops and very little food laid by, encamped on a swampy peninsula where the drinking water was bad. Long before the spring of 1608 many of the colonists grew sick and died. The remainder, about half the original 104, were kept alive through the boldness and cleverness of Captain John Smith in obtaining supplies of corn from the Indians.

The Starving Time. The first winter at Jamestown was bad enough. But the winter of 1609–10, "The Starving Time," was far worse. Of the more than 300 people in the settlement, sixty survived. This small band saw spring come with one wish and only one—to abandon the colony and take ship for home. On their way down the river, the survivors spied ships flying the British flag. It was the fleet of Lord de la Ware, the new governor, sent out by the Virginia Company and bringing men and supplies. Thus was Jamestown saved to become the first permanent English colony in America.

Tobacco. Good times for Jamestown and for the Virginia Colony were in the offing. A young planter, John Rolfe, discovered a new way of curing tobacco, so

Fig. A. The Victory Monument at Yorktown. Near this site Washington received the surrender of Lord Cornwallis.

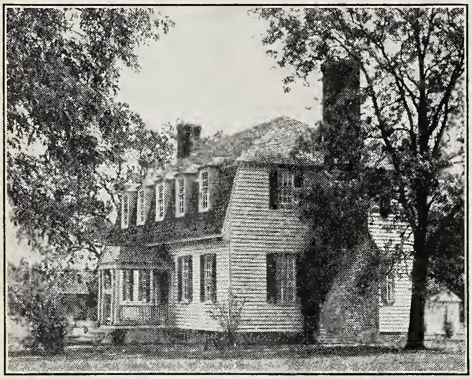


Fig. B. In this house, the Moore House at Yorktown, was made the agreement under which Lord Cornwallis surrendered to General Washington.

as to make it a profitable article to export. This gave the colonists in Virginia a money crop to sell in exchange for goods which they needed but could not produce in America.

The people of Europe were rapidly acquiring a liking for tobacco, so that the market for Virginia tobacco was expanding faster than the Colony could supply the demand. Fortunately, the soil and climate of Virginia were well adapted to the growth of the plant.

As the culture of tobacco became more profitable, more settlers came from England, and new plantations were cleared along the wide Virginia river. When young women came from England to marry the planters, the English home replaced the half-military camp of the earlier years, and the future of Virginia as a colony was assured.

The Old Dominion. By 1624 the Virginia Colony had about 1000 persons. Factories for the manufacture of glass and iron foundries had been established. From fifty to sixty thousand pounds of tobacco were being exported each year.

When the British people beheaded their king, Charles I, Virginia was the first to recognize Charles II—even, indeed, before he was actually restored to his father's throne. This support pleased King Charles II very much. He called Virginia "the best of my distant children," made the Colony a dominion and placed the seal of the Virginia Company beside that of England, Ireland, and Scotland on the royal coat of arms. The people of Virginia were quite proud to be inhabitants of one of the King's dominions, and referred to their good land as "the Old Dominion," as do the people in Virginia to this day.

Virginia in the Revolution. Virginia supported with zeal the Revolutionary cause, sending George Washington to command the armies and thousands of her men as soldiers and officers. The Northwest Territory was won by an army from Virginia, commanded by George Rogers Clark and put into the field at Virginia's expense.

Of actual fighting, there was not a great deal on Virginia soil until the last year of the war. In 1781 Benedict Arnold

in command of an English army captured Richmond. Later in the same year Cornwallis brought together all the British forces in Virginia at Yorktown, only to be forced to surrender to Washington supported by the French army and fleet. Thus the closing scene of the great struggle for American independence took place in the Old Dominion. Plan to visit Yorktown sometime.

Virginia at the Constitutional Convention. Virginia's leaders, including Patrick Henry, were the first to urge a strong central government for the American Colonies. The Constitutional Convention at Philadelphia was but four days old when Governor Randolph of Virginia presented fifteen resolutions called the "Virginia Plan." This plan, after several compromises, became the basis of the Constitution of the United States. When you read the Constitution, you will find that representation in the House of Representatives at Washington is proportioned according to population. For this Virginia is chiefly responsible.

Virginia—mother of presidents. During the early and critical period of our national life, Virginia gave seven presidents to the nation: Washington, Jefferson, Madison, Monroe, Harrison, Tyler, and Taylor. Later, much later, Virginia-born Woodrow Wilson guided our country through the period of the World War.

Other Virginians who have made contributions to the welfare of our country are Robert E. Lee, soldier and educator; Meriweather Lewis, leader of the Lewis and Clark Expedition; Sam Houston, liberator of Texas; Winfield Scott, soldier; Cyrus H. McCormick, inventor of the reaper; and Dr. Walter Reed, discoverer of the yellow fever germ. Can you name other famous Virginians?

Fig. A. St. John's Church, Richmond, where Patrick Henry made his famous "Liberty or Death" speech.

Virginia—battleground in the War Between the States. During the War Between the States, Virginia felt the tramp of marching feet more often than any other state. The campaigns of the Army of Northern Virginia under the skilful and inspiring leadership of General Robert E. Lee and the repeated attempts of the Northern commanders to take the capital city, Richmond, have crowded the Old Dominion with historic landmarks.

Some of these, with a number of places famous in Revolutionary times, have been listed for you in the Appendix, Table II. Thousands of tourists visit Virginia each year to live over again the campaigns of Washington and Cornwallis and of Grant and Lee. These historic pilgrimages are made doubly pleasant by Virginia's excellent system of hard-surfaced highways, and by highway markers which contain a brief, accurate description of each place of interest.

Virginians today. In 1790, the year of the first Federal Census, Virginia ranked

Fig. A. Distribution of population in Virginia. Each dot on this map represents 1000 people. Why are parts of some counties almost solid black?

first among the states in population, with 747,610 people. Today, the Old Dominion ranks twentieth, with about 2,500,000 people. In spite of the growth in population, the state is not crowded. Virginia has approximately 60 people to the square mile, compared with about 42 for the United States as a whole, and 644 for Rhode Island. If Virginia were as crowded as is Rhode Island, we would have about 25,000,000 people. Would such a large population be desirable? Explain.

Urban and rural population. If you look at Figure 8-A, you will see that large numbers of our people are congregated near Hampton Roads and in the vicinity of Richmond, Roanoke, and Lynchburg. Virginians, however, are not city dwellers to the extent that the people of some of the other states are. Thirty-two of every hundred Virginians live in places of 2500 population or over. They are our urban population. The remainder of our people, about 68 in every hundred, live either on farms or in very small communities. They are our rural population. Virginia's population, in this respect, might be contrasted with Massachusetts, 90 per cent urban, 10 per cent rural, or with Mississippi, 17 per cent urban, 83 per cent rural.

What is the population of the community in which you live? Is it an urban or a rural community?

Races and nationalities. About 73 people of every hundred in Virginia are white people, 26 are Negroes, and a few—very few—are of other races—Indians, (about 800), Chinese, and Japanese.

Nearly all the white people of our state are native-born (98.7 per cent). About 24,000 are foreign-born. They have come to live with us in the Old Dominion chiefly from England, Germany, Russia, Italy, Canada, Greece, Poland, and Scotland.

THINGS TO THINK ABOUT

1. What date may be said to be the birthday of Virginia?
2. What do you understand by the terms *urban* and *rural* population?
3. Do you think the Jamestown colonists used poor judgment in their choice of a site for the new settlement?
4. What is a money crop? How did a good money crop insure the prosperity of Virginia as a colony?
5. How did Virginia acquire the name of "The Old Dominion"?
6. What is the population of the county in which you live? its area? its population per square mile?
7. How does the density of population per square mile in your county compare with that of the State of Rhode Island?

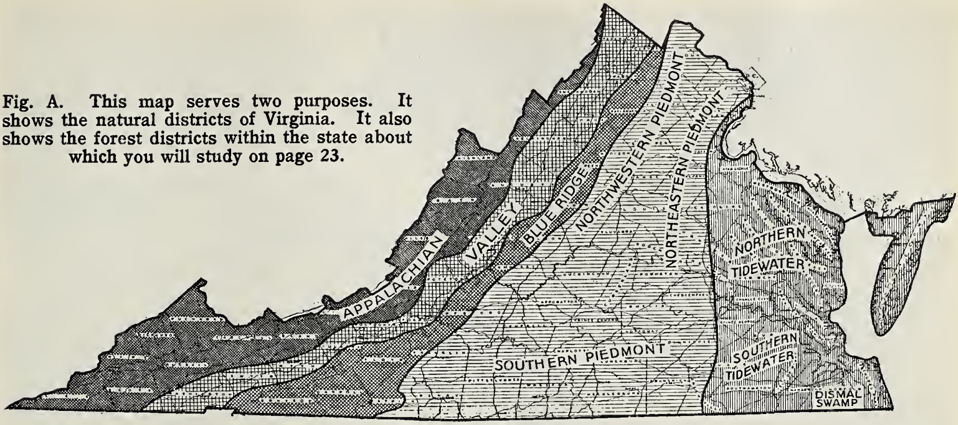
THINGS TO TALK ABOUT

1. Had I been one of the first group of colonists at Jamestown.
2. A passage to the Indies.
3. The "Virginia Plan."
4. The historical landmark nearest our community.

THINGS TO DO

1. Prepare a brief biography of the life of one prominent Virginian. You may choose, if you like, some individual not mentioned in the text.
2. Trace the outline of your pattern map. Insert your county. Show the population of the county by dots. Let each dot represent 2000 persons.

Fig. A. This map serves two purposes. It shows the natural districts of Virginia. It also shows the forest districts within the state about which you will study on page 23.



UNIT III—THE LAND ON WHICH WE LIVE

Lowlands and highlands. The physical and political map of Virginia, Figure 2–3-A, helps you to see quickly where the lowlands and the highlands of our state are located. These lowlands and highlands can be seen also in Figure 9-A. Find two mountain areas on this map; a long, narrow valley; a lowland by the sea; the Piedmont.

You can also see by the maps that the highest land in Virginia is in the western part of the state; Mount Rogers, Grayson County, rises to a height of 5719 feet. As the traveler winds his way eastward along the valley of one of our streams, he finds that he is going *downhill*. We say, therefore, that Virginia slopes from the west toward the east. What is the height of land in the neighborhood of your home?

Five natural districts. Suppose you have a friend who knows little or nothing about Virginia and you want to describe to him the kinds of land to be found in the Old Dominion. Surely you would not tell him about the surface of each of the 100 counties into which the state is divided. They are too many and the details would be too great for the mind to grasp. You would probably describe the state as divided into a half-dozen or so parts, each of which has essentially the same kind of surface and soil throughout its entire area. Fortunately, the surface of Virginia lends itself readily to division into *natural districts*, as we shall call them, or *physiographic provinces*, if you like big words.

These natural districts are located for you on the map (Fig. 9-A). Name them. In which district do you live? The surface of the land, the soil, the natural vegetation, the crops, and the kinds of work that people do within each district differ *somewhat* from the natural conditions and human activities in every other district. The line between any two districts is not a sharp boundary. One district merges into another as winter changes to spring.

Tidewater Virginia. The Virginia section of the Atlantic Coastal Plain of North America is bordered by the sea on the east and the Fall Line or Fall Zone (page 10) on the west. It occupies about one fifth of the state and has been divided by the larger rivers into tongue-necks of land or peninsulas. From north to south they have been called:

"Northern Neck," between the Potomac and the Rappahannock;

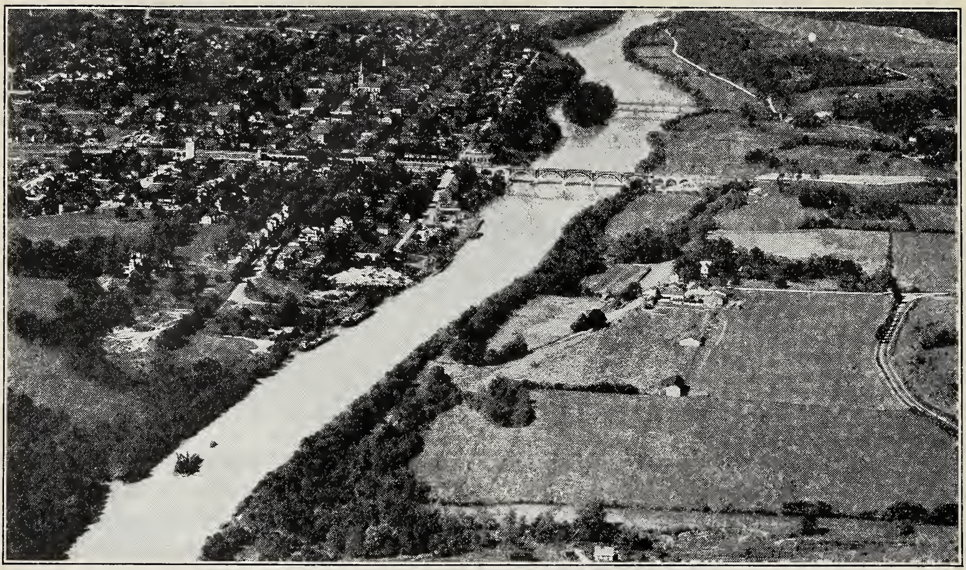


Fig. A. Fredericksburg on the Rappahannock River.

"Middle Peninsula," between the Rappahannock and the York;

"Williamsburg Peninsula," between the York and the James;

"Norfolk Peninsula."

Much of the coastal plain of Virginia is *stairstep* land. The traveler, making his way from sea level toward the west, comes to a steep slope facing eastward. When he has climbed to the top, the land before him is level, but off in the distance there is another slope, then level land (terrace), then another slope, and so on somewhat like the staircase in your home. These terraces support a great truck farming industry and at the south a peanut-growing district.

The Eastern Shore. The counties of Northampton and Accomac on the eastern side of Chesapeake Bay are also part of the Coastal Plain, but otherwise have no connection with the remainder of the state. They form the lower end of the Delaware-Maryland-Virginia Peninsula, which increasingly is being referred to as *Delmarva.* Northampton and Accomac counties are noted especially for early potatoes, strawberries, early vegetables, and sea foods.

The Fall Line. Between the Coastal Plain and the Piedmont is the Fall Line or Fall Zone. It extends almost due north and south through the state from Washington through Fredericksburg, Richmond, and Petersburg, to the North Carolina line. Indeed, it extends beyond the limits of Virginia, southward at least to Columbus (Georgia) and northeastward to New Brunswick, New Jersey, and beyond.

At or near each of these places are rapids or waterfalls in the streams, beyond which the boats of early settlers could not go. The settlers landed, made settlements, and in many places used the swiftly flowing water to turn waterwheels for great mills and other kinds of manufacture. If you pretend that a line has been drawn connecting these waterfalls, you may call the line the *Fall Line.*

The Virginia Piedmont. The word *piedmont* means "at the foot of the

mountain." In the United States the Piedmont Plateau is a rolling upland country on the eastern side of the Appalachian Mountains lying between the mountains and the Atlantic Coastal Plain. It extends from Alabama to the Hudson River.

The Virginia section is sometimes called "Middle Virginia." It slopes seaward from about 1000 feet elevation in the foothills of the Blue Ridge Mountains to approximately 200 to 150 feet at the Fall Line. This is the great tobacco-growing district of the state.

The Blue Ridge. The famous Blue Ridge Mountains of Virginia swing in a broad crescent from Harpers Ferry on the Potomac River to a point a little east of Bristol on the south line where the ridge passes into North Carolina. This mountain belt is from three to twenty miles wide and varies in elevation from about 1400 feet at Harpers Ferry to 5719 feet at Mount Rogers, Grayson County, the highest point in the state.

The Great Valley. The Great Appalachian Valley, as you have learned from your study of the United States, opens a broad highway through the Appalachian Highlands from Birmingham, Alabama, to the Hudson River. All the way the traveler may see to the east and to the west mountains which run parallel to the Great Valley, but never cross it.

The Valley of Virginia varies from 75 to 100 miles in width. To the north it is drained by the Shenandoah River; in the middle, by the James and Roanoke rivers which break through the Blue Ridge to the sea; and to the south, by the New and Holston rivers. The valley is not all level country. It has ridges, which extend generally from northeast to southwest, rising from the valley floor. From Bald Knob, in Giles County, one may see on a clear day a dozen of these parallel ridges.

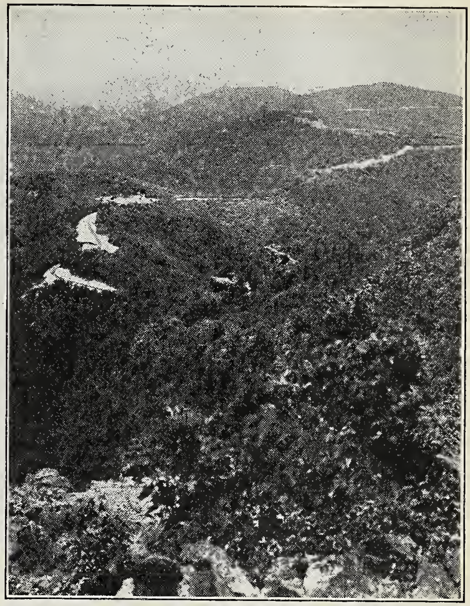


Fig. A. The white ribbon which you see winding along the top of the Blue Ridge Mountains is Skyline Drive, Shenandoah National Park.

Here are Natural Bridge, Virginia's famous limestone caverns, and splendid blue grass pastures. The raising of livestock and apple culture are famous industries in this historic valley.

The Appalachian Province. The Province gives the traveler the impression that Nature was in a hurry when she made it. She seems to have assembled here a large number of irregular hills, peaks, and valley lands with no time to array them into orderly, parallel ridges and broad, open valleys, as she did in the Great Valley.

The Appalachian Province is one of the leading coal-mining and lumbering districts of the state.

THINGS TO THINK ABOUT

1. In which natural district of Virginia do you live?
2. What other natural districts in Virginia have you visited?
3. Which of the natural districts of Virginia would you choose for a home? Why?

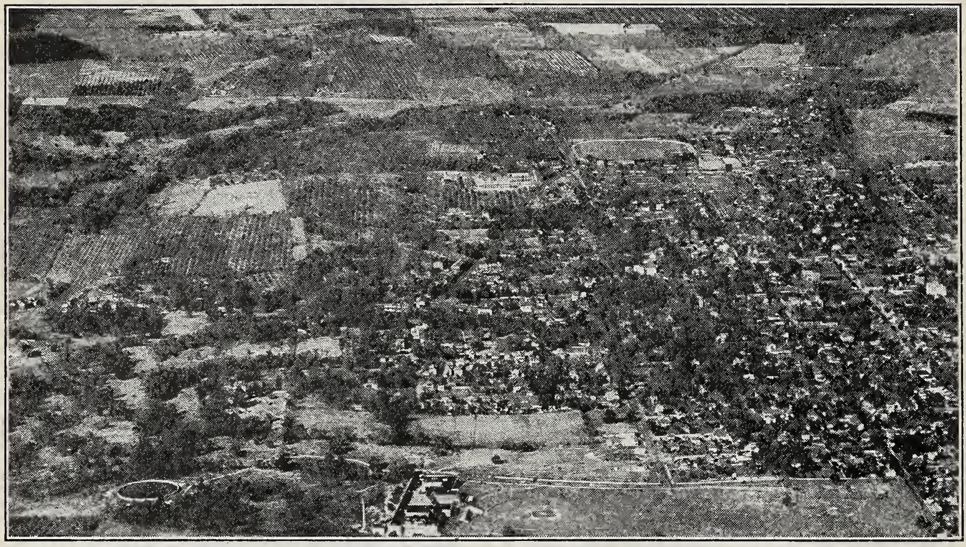


Fig. A. Winchester, at the head of the Shenandoah Valley. The rolling country in the background of the picture shows a few of Winchester's famous apple orchards.

4. What natural districts in Virginia might be called a "jumble of mountains and valleys"?
5. "An island of farms amid a sea of mountains." Which natural district is best described by this quotation?
6. Why has the tidewater section of Virginia been called "stairstep" land?
7. How did the "Fall Line" get its name? What influence did this zone have in early settlement? on the development of manufacturing?
8. How does the surface of the Piedmont differ from the surface of the coastal plain?
9. Why is the "Blue Ridge" so called?

THINGS TO TALK ABOUT

1. The natural districts of Virginia as parts of much larger North American regions.
2. How these larger regions of the continent differ one from another.

THINGS TO DO

1. Sketch an outline map of Virginia.
2. Indicate the community in which you live.
3. Locate and name each natural district.
4. Sketch an outline map of Eastern United States. Show on this map that the natural districts of Virginia are a part of larger North American regions.
5. Model Virginia, using a mixture of flour and salt. Show the natural districts.

UNIT IV—COASTAL AND INLAND WATERS

Atlantic drainage. All the water that Virginia receives either as rain, hail, sleet, snow, or other forms of moisture, finds its way either to the Atlantic Ocean or to the Mississippi River. We say, therefore, that Virginia has both Atlantic and Mississippi drainage.

Within the state, however, most of our streams gather their waters through tributaries and flow directly to the Chesapeake Bay or to the ocean. A few streams have their sources in Virginia, only to leave the state on their way to join the Mississippi. Find some of these streams on Figure 2-A. We can divide Virginia, therefore, into several large *drainage basins.*

A drainage basin of a stream includes all the land from which water flows to that stream. Between basins the land is higher. This higher land is called a *divide* or *water parting.* On one side of the divide water flows to one stream. On the other side of the divide water flows to a different stream.

The Potomac. Virginia shares the Potomac with Maryland and the District of Columbia. Together with its chief tributary, the Shenandoah, it drains the northern part of the Valley of Virginia, the Blue Ridge, the Piedmont, and the Coastal Plain. A channel of at least 24 feet in depth and 200 feet in width is maintained from Washington to the sea.

The Rappahannock. The Rappahannock River, with its chief tributary, the Rapidan, lies wholly within the state. Its source is in the Blue Ridge which it drains, along with the northeastern part of the Piedmont and the Coastal Plain. The river is a tidewater stream, at least 12 feet in depth from Chesapeake Bay to Fredericksburg on the Fall Line.

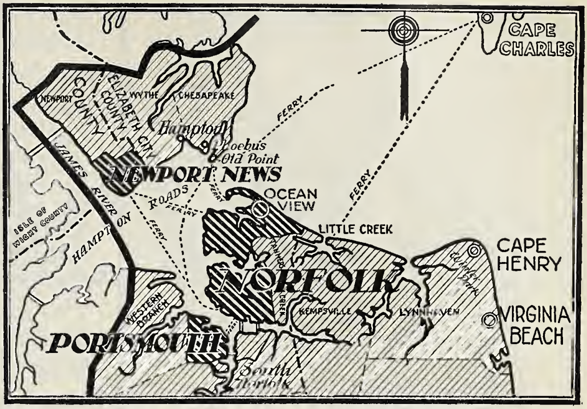


Fig. A. At the mouth of the James River is Hampton Roads. Tell why Hampton Roads is such a good harbor for ships.

The York. The York River is a tidewater stream wholly within the state. It is formed by the junction of the Pamunkey and the Mattaponi rivers at the town of West Point, King William County. The channel of the river has a depth of at least 22 feet from West Point to the Chesapeake.

The James. The James River has its source in the northern part of Botetourt County. Thence it flows eastward across the Great Valley, breaks through the Blue Ridge and continues on its way over Piedmont and the Coastal Plain to the sea. In the earlier years of our country the river was navigated for commercial purposes as far upstream as Buchanan, Botetourt County. Later a canal was built to parallel the main stream. The canal carried as much as 230,000 tons of cargo a year. Navigation of the river today, however, is chiefly between Richmond and the sea. The Federal Government is at work on a project for deepening the stream to 25 feet from Richmond to Hampton Roads.

Other river basins. Southeastern Virginia drains chiefly into the Chowan River; southern Virginia, into the Roanoke; and southwestern Virginia, into the Tennessee by way of the Holston, Clinch, and Powell rivers. These streams are not navigable commercially, but they may be used for the development of water power.

Rivers, friends of man. Of what use are rivers, you may ask. One answer is that some rivers are *navigable,* that is, they are deep enough to float large ships carrying passengers and freight. You have learned about the navigability of the Potomac, Rappahannock, York, and James.

Water power. Another answer is that some rivers can be used for power. The force of swiftly flowing water at a waterfall or rapids can be used to turn water wheels. The moving wheel can then be used to saw wood, grind grain, and do many other tasks. Nowadays, the rushing water turns a wheel called a *turbine.* The turbine operates a machine called a *dynamo,* and the dynamo makes electricity. We call this *water power,* or *hydroelectric energy.*

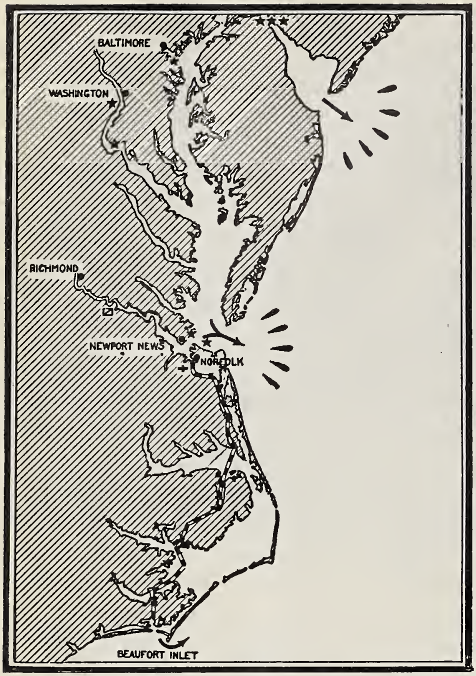


Fig. A. A part of the Atlantic Inland Waterway. Trace the inland passage for ships southward from Norfolk to Beaufort Inlet.

Today, Virginia ranks twenty-fourth among the states in the amount of water power which is being used, and seventeenth in the amount of water power which can be developed.

Water power is a useful servant. It will pump water, drain swamps, light buildings, drive machinery, and supply power for almost any other kind of task. One horsepower of electrical energy is equal to about seven men working very hard. But the water power never tires, never gets sick, and never takes a vacation, except in seasons of severe drought.

The Chesapeake and the Inland Waterway. Figure 14-A shows that Chesapeake Bay is an important link in the Atlantic Inland Waterway. This waterway, when it is completed, will permit large ships to sail from Boston to the Gulf of Mexico without going out into the open sea except for short distances along South Carolina and Georgia. How will ships pass from Norfolk to Albemarle Sound?

The Dismal Swamp and other wet lands. In Norfolk and Nansemond counties and extending into North Carolina is the Dismal Swamp with Lake Drummond. Despite its name, the area is not "dismal." The George Washington Highway runs through it and the automobilist can roll along today through country that at one time was forest-covered and almost impenetrable. Much of the Dismal Swamp and other wet lands of the Tidewater District have been drained and converted into the best possible kind of truck farms.

THINGS TO THINK ABOUT

1. Do you live in the drainage basin of a stream or on a divide?
2. What navigable stream is nearest your home?
3. Into what body of water does that stream flow?
4. What is a drainage basin?
5. What streams in Virginia are navigable for ships carrying passengers and freight? To what point is each of these streams navigable?
6. How is electricity generated by the force of flowing water?
7. How may the Inland Waterway, when completed, be of advantage to Virginia?
8. What do you understand by reclamation of wet lands?

THINGS TO TALK ABOUT

1. Source of supply for our drinking water.
2. Virginia must have clean rivers.
3. Water power—a willing servant.

THINGS TO DO

1. On a sketch map of Virginia, outline each drainage basin.
2. Locate and name each river. By double lines show that part of the river which is navigable commercially.
3. Write the life story of a tumbling mountain stream. Be sure to tell how your stream supplies power.

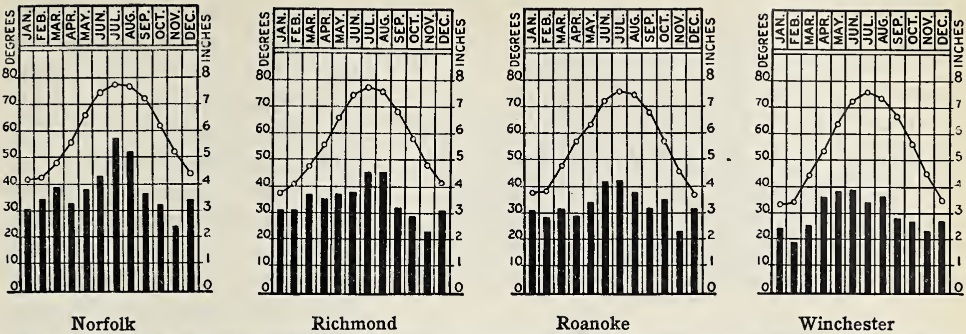


Fig. A. The bars on these charts show average monthly rainfall; the curved lines show temperatures in degrees Fahrenheit.

UNIT V—VIRGINIA'S WEATHER

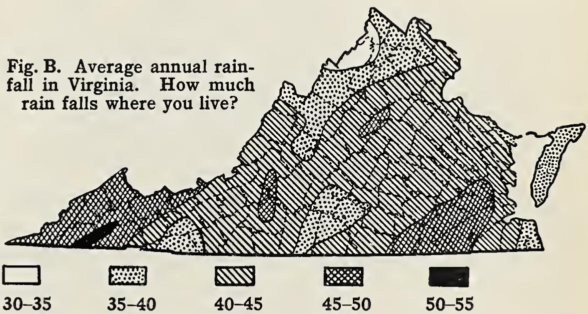


Fig. B. Average annual rainfall in Virginia. How much rain falls where you live?

Maps and charts to use. Probably the best way for you to begin the study of weather in Virginia is to examine carefully the rainfall and temperature maps (Figs. 15-B, 16-A–B); the frost-growing season maps (Figs. 17-A–B); and the monthly rainfall-temperature charts (Fig. 15-A). These maps and charts were made expressly for your use by the United States Weather Bureau. Be sure to read the legend for each map or chart.

Weather and climate. In which season of the year did your class begin its study of weather in Virginia? during which month? on which day of the month? Perhaps your class began this topic early in February when the weather out of doors is very changeable. One day may be warm. The sun shines brightly; the birds sing; the grass begins to grow. That night a cold blast comes out of the northwest. Down goes the thermometer and there may be ice on the ponds before morning. We speak of all day-by-day changes in the air about us as our *weather*. Weather includes conditions of heat and cold, moisture and dryness, clearness and cloudiness, wind and calm.

Weather answers such questions as these: Did it rain last Tuesday? What was the temperature on the Fourth of July? When did the first frost occur last autumn? Weather, however, does not tell the farmer when he can plant without fear of a late frost; how early he must gather his crops to escape an early frost; or how much rain he may reasonably expect during the growing season. Questions such as these can be answered only by observing the weather day by day for a long period of time.

This is the job of the United States Weather Bureau. Its stations in Virginia have daily records of weather conditions extending back for many, many years before you were born. The bureau can tell you about how much rain may reasonably be expected at any place in Virginia in a month, a season, or a year; how hot

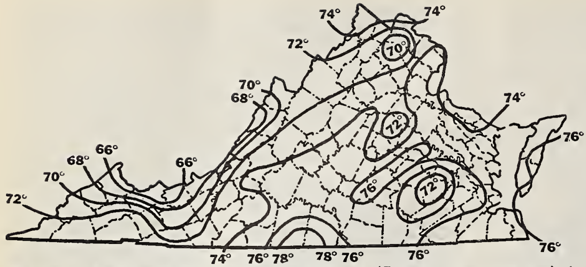


Fig. A. Average summer temperatures (June, July, August) in Virginia.

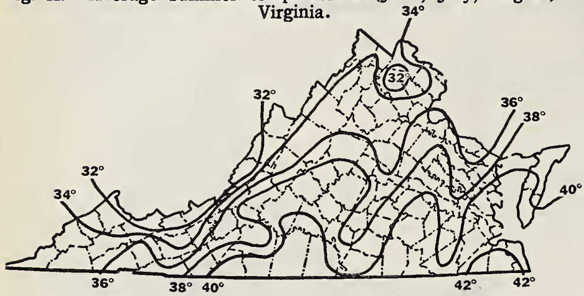


Fig. B. Average winter temperatures (December, January, February) in Virginia.

the summer weather may be and how cold the winter; when the first and last frost may be expected; how long the growing season will last, and other facts about *general weather conditions* in the state. Such general facts about the weather of a place we speak of as *climate*. The charts and maps (pages 15–16) are climate charts and maps. They show general or average weather conditions.

Rainfall. The map (Fig. 15-B) shows that at least 40 to 45 inches of rain can reasonably be expected in most parts of Virginia each year except in the southwestern part where the rainfall is somewhat greater, and in certain scattered sections (Fig. 15-B), where it is somewhat less.

Suppose you live in that part of Virginia which has 40 inches of rain a year, on the average. Suppose you place a wide, deep pan on your roof and have some way of preventing the moisture which falls into the pan from evaporating. Then, at the end of the year, the water in the pan would be 40 inches deep; provided, of course, that 40 inches of rain had fallen during that year. Some years have more, some less. The map shows the average for a number of years.

Rain in Virginia, however, is fairly evenly distributed from month to month (Figs. 15-A). The least amount of rain falls during the autumn months, especially November. Most rain falls during the spring and summer months, especially June, July, and August. Virginia farmers can be reasonably certain of at least 3 inches of rain a month during the time their crops are growing.

Temperature. Virginia lies south of the center of the north temperate or north intermediate zone. This means that Virginians must expect cool to cold winters and warm to hot summers. Figure 15-A shows that Norfolk in winter is several degrees warmer than Roanoke. This is because Norfolk is but 10 feet above sea level. Roanoke is 907 feet. For every 300 feet one climbs, the temperature drops one degree. Then, again, Norfolk is by the sea, which in our part of the world is warmer in winter than is the land.

In summer, however, Norfolk, Virginia Beach, and other Virginia communities near the sea are as cool as the higher mountain lands. Why is this? The ocean is the answer, for it is cooler than the land in summer. Breezes from off the sea temper the summer heat.

The growing season. The sea is as kind to plants as to humans. Figures 17-A–B show that the district about Norfolk has from 200 to 230 frost-free days each year. Frost is weather cold enough to stop most

plants from growing and to kill some plants.

Figures 17-A–B show that most of the Piedmont and all the remainder of Tidewater Virginia has a growing season of from 190 to 200 days. This is not quite enough for cotton, but is sufficient for corn, wheat, and most other crops. In the mountain-valley section of the state, however, the growing season is much shorter, certainly not over 180 days, and in some of the higher mountain land not over 150 days. Crops in some parts of western Virginia have a scant five months in which to ripen. Crops in Norfolk have seven to eight months. Not infrequently, therefore, two, three, and even four crops are taken in a year from the same field in the lower Chesapeake sections of the state.

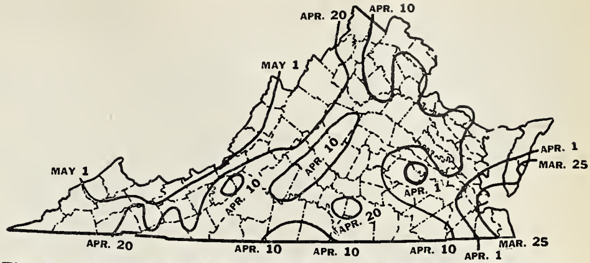


Fig. A. Average dates of the last killing frost in the spring in Virginia.

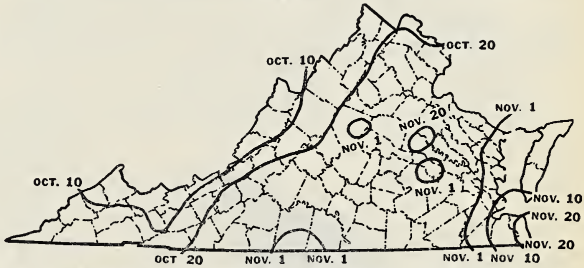


Fig. B. Average dates of the first killing frost in the fall in Virginia.

A "good" climate. Several years ago a man wrote a book about climate in the United States. He said that the best climate for most people most of the time has frequent, moderate weather changes, variations in temperature from season to season, a reasonable amount of cold during a part of the year, clear weather mixed with cloudiness, and rainfall sufficient for grass and crops. How does the weather in your neighborhood measure up to the "good" standard of the book?

THINGS TO THINK ABOUT

1. What is the distinction between "weather" and "climate"?
2. How is the length of the growing season measured?
3. What is meant by an inch of rain? ten inches? 40 inches?
4. What is the average rainfall where you live? average summer temperature? average winter temperature? average length of the growing season?
5. Why are the Virginia coastal lands warmer in winter than our mountain lands? Why are the temperatures of these two sections almost the same in summer?

THINGS TO TALK ABOUT

1. A "good" climate.
2. The growing season.
3. The climate maps and charts in this book.

THINGS TO DO

1. Make an enlarged copy of the following chart, either in your notebook or on a sheet of cardboard.

WEATHER IN OUR NEIGHBORHOOD

Date	Day of Week	Temperature	Wind Direction	Barometer	Rain or Shine	The Sky		Forecast for Tomorrow
						Cloudy	Clear	

2. Keep a daily weather record for one month.
3. Write the United States Weather Bureau, Washington, D. C., and ask under what conditions the daily weather maps may be mailed to your school for a period of one month. There may be a charge for this map. Use such maps as you may be able to get in forecasting weather conditions in your neighborhood.

(2) Wheat, Fruits, Poultry, Dairy, Livestock. (3) Wheat, Fruits, Poultry, Dairy, Livestock. (4) Tobacco, Fruits, Dairy, Poultry. (5) Tobacco, Fruits, Dairy, Poultry. (6) Truck, Wheat, Poultry. (7) Livestock, Tobacco, Fruits, Truck. (8) Tobacco. (9) Peanuts, Cotton, Tobacco, Truck, Hogs.

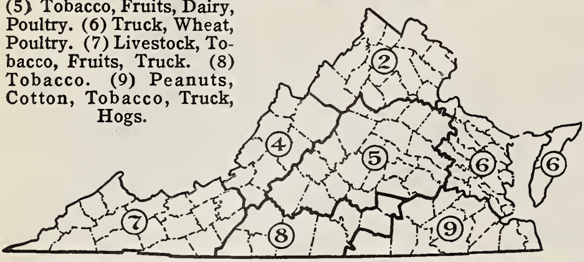
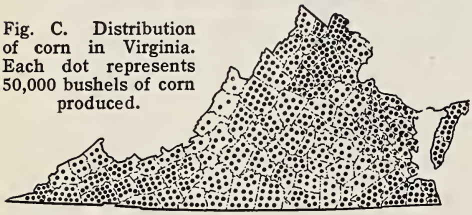


Fig. A. Virginia crop districts as selected by the Virginia Department of Agriculture. What are the leading crops in the district in which you live?

Fig. B. The black areas on this map show the chief tobacco-growing sections of the state.

Fig. C. Distribution of corn in Virginia. Each dot represents 50,000 bushels of corn produced.



UNIT VI—VIRGINIA'S FARMS AND ORCHARDS

Maps for you to study. Figures 18-C, 19-A–D, 22-A–C are valuable maps for you to use as you study farming and stock raising in Virginia. They are dot maps. Each dot represents a certain number of acres sown to a particular crop, a certain number of tons, bushels, boxes, or pounds produced, or a certain number of farm animals raised. Space in this book does not permit the use of dot maps for all of Virginia's crops and farm animals. Those crops and animals were chosen which bring the most money to the farmers of the state.

Virginia's rank in agriculture. Virginia's fame in agriculture rests on the large variety of products which can be grown in the Old Dominion and the excellence of those products rather than on the total value of crops produced. In 1934 Virginia had crops valued (in round numbers) at $104,000,000. This gave the Old Dominion twenty-second rank among the states. California, the leader, had crops valued at approximately $350,000,000 during the same year.

Agricultural districts. The Virginia State Department of Agriculture at Richmond has drawn for you the map of Virginia Crop Districts which you see in Figure 18-A. What is the name of the crop district in which you live? What are the principal crops grown in your crop district? Statistical Table IV gives the production and farm value of all of these crops.

The lower Chesapeake district and the Eastern Shore. This is the great trucking district of Virginia which supplies northern markets with fresh vegetables before the crops of New Jersey and Long Island are far enough advanced to pick.

Northampton and Accomac counties (among the first counties in the United States in crop value per acre of farm land) specialize in the growing of early white potatoes and Virginia's "Golden Sweets."

In the vicinity of Hampton Roads potatoes, spinach, kale, and other truck crops are grown intensively.

The long growing season and light, sandy soils in Nansemond, Southampton, and other southeastern counties are suitable for growing peanuts. Here about one fifth of the total peanut crop of the United States is grown. Suffolk is said to be the largest peanut market in the world.

Norfolk and Petersburg also prepare large quantities of the nuts for market.

The upper Tidewater District. Vegetable growing is also the chief farm activity in Tidewater Virginia north of the James River. Why are the climate and soil here good for truck farming? Farms specializing in the production of early tomatoes and tomatoes for canning are common in this district.

The Piedmont south of the James. This is the great tobacco district of the state, dark tobacco to the north, the more costly bright tobacco to the south, with a section about Richmond growing a special kind of sun-cured tobacco produced nowhere else in America. Figure 18-B also shows a section in the extreme southwest near the North Carolina line devoted to Burley tobacco.

The principal market centers for Virginia tobacco are Danville, South Boston, South Hill, Lynchburg, Farmville, and Richmond.

The Piedmont north of the James. North of the James, tobacco growing gradually gives place to general farming on the more level lands. Corn, wheat, and other field crops are grown, and dairying and poultry raising are important. In the rougher sections fruit is grown, especially apples and peaches about Charlottesville. The famous Albemarle Pippin comes from this district, as well as other parts of the state.

The Valley of Virginia. This island of farms in a sea of forest-covered mountains is one of the garden spots of the world. The land is level to gently rolling. The soil, derived chiefly from limestone, is very fertile. The growing season and the seasonal distribution of rain (Fig. 15-A) just suit most crops of the cooler parts of the north temperate zone.

The traveler entering the valley near

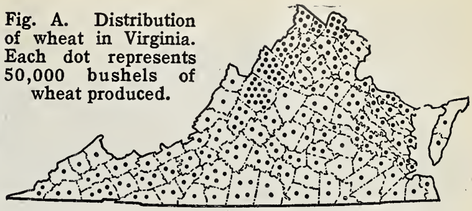


Fig. A. Distribution of wheat in Virginia. Each dot represents 50,000 bushels of wheat produced.

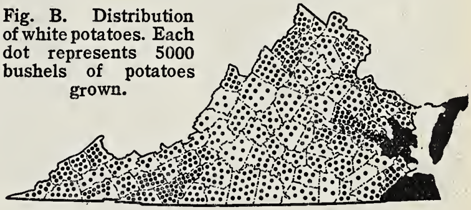


Fig. B. Distribution of white potatoes. Each dot represents 5000 bushels of potatoes grown.

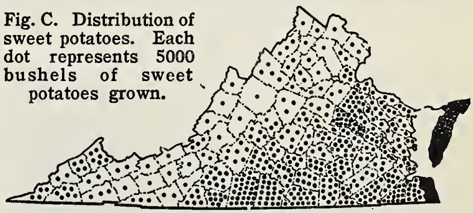


Fig. C. Distribution of sweet potatoes. Each dot represents 5000 bushels of sweet potatoes grown.

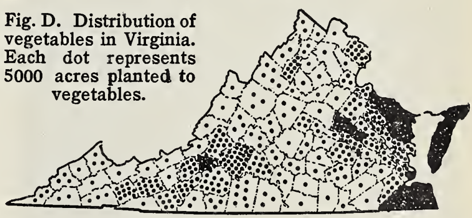


Fig. D. Distribution of vegetables in Virginia. Each dot represents 5000 acres planted to vegetables.

Winchester finds himself in the center of one of the most famous apple districts in the world. Here grow the Virginia winesaps and many other varieties in such profusion that Virginia ranks third among the states in the production of this delicious fruit. Farther south, especially about Timberville, the apple orchards give place to peach growing.

The Valley farmers also specialize in dairying, the fattening of cattle and other livestock, and the raising of poultry. To feed these animals and birds, the Valley farmers grow huge crops of corn, oats, hay,

Fig. A. Harvesting peanuts in the Southern Tidewater section of Virginia.

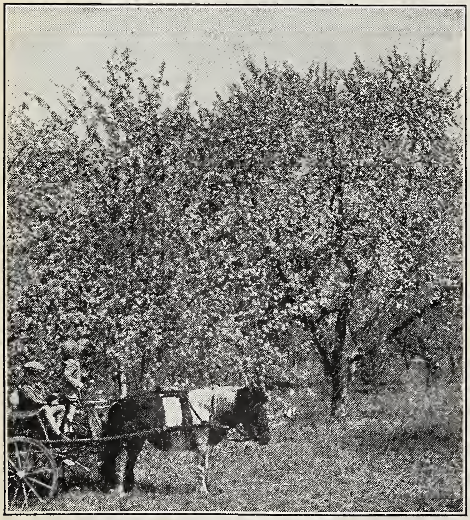


Fig. B. Apple blossom time in the Valley of Virginia.

and other forage crops. You will read more about livestock in Virginia in Unit VII of this book.

In the neighborhood of Rural Retreat, Wythe County, the farmers are concerned chiefly with the growing of cabbage. This is a late cabbage, harvested from July to November and marketed throughout the entire South.

THINGS TO THINK ABOUT

1. Why is the Valley of Virginia such a rich crop and livestock district?
2. Why do tobacco and other crops give place to orchards in the rougher parts of the Piedmont?
3. What is the crop grown chiefly by the farmers in the county in which you live?
4. What natural conditions aid in producing that crop?
5. Where is the crop marketed?

THINGS TO TALK ABOUT

1. Hilly land and the fruit industry.
2. Tidewater lands and the early vegetable industry.
3. Chief crops in our neighborhood.

THINGS TO DO

1. Pretend that you have chosen farming as your life work. Tell where you bought your farm and why you selected that particular piece of land. Write a paragraph which pictures your farm. Tell what crops you would grow and why you would grow them.
2. Write a short news article for your school paper on the topic: "Virginia's Advantages for the Farmer."
3. Report to the class on the Apple Blossom Festival at Winchester.
4. Copy and complete the following chart about crops (Figs. 18-C; 19-A–D) and livestock (Figs. 22-A–C) in Virginia.

Crop or Animal	Chief Producing Counties
Corn	
Wheat	
Potatoes (White)	
Potatoes (Sweet)	
Vegetables	
Cattle	
Hogs	
Sheep	

UNIT VII—VIRGINIA'S ANIMAL AND POULTRY INDUSTRIES

Quality, not quantity. Virginia's fame as a producer of livestock must also rest on the excellence of the product rather than on the number of farm animals or poultry living within the state or the rank of Virginia among the states in the livestock industry. This fact is shown clearly by the following table:

Fig. A. These cattle are grazing in Russell County on a farm of a former governor of Virginia.

VIRGINIA'S LIVESTOCK			LEADING STATE	
Kind	Number	Rank	Name	Number
All cattle..	800,000	31	Texas....	6,000,000
Dairy cattle...	385,000	23	Wisconsin.	2,000,000
Swine.....	560,000	24	Iowa.....	10,000,000
Sheep.....	470,000	27	Texas....	8,000,000
Horses....	167,000	22	Iowa.....	900,000
Chickens..	10,000,000	18	Iowa.....	35,000,000

That *quality,* not *quantity,* is the aim of our livestock industry seems to be amply proved by the enormous popularity of the Smithfield Ham, famous for its flavor for more than 150 years, and by the equally famous Virginia Ham, Virginia-fed beef, and choice Virginia lamb. Restaurants and hotels in all parts of the United States east of the Mississippi feature on their menus "Virginia Ham." It is the standard of excellence. Unfortunately, however, not all ham so listed comes from Virginia.

Natural conditions in Virginia which favor the livestock industry. Rainfall, well-distributed throughout the year, combined with a relatively long growing season produces an abundance of excellent pasture in nearly all parts of the state. These two natural factors, combined with limestone soil in the western and southwestern sections, cover large areas of these rolling uplands with the famous blue grass, than which there is no better food for cattle, sheep, and other livestock.

Beef cattle. Beef cattle are thick and chunky. They are raised chiefly for their meat. Figure 22-A shows the relation between "beef and blue grass" in the Old Dominion. Many of our beef cattle are born and live for a time on our hilly, upland farms. Then they are bought by valley farmers who fatten the animals for market on corn and other forage crops. Feeder cattle are also purchased from the ranches of western and southwestern states for fattening in the Old Dominion.

Dairy cattle. The dairy cow is a far different animal from the beeve. She is a kind of natural milk factory. She eats grass and other cattle foods and drinks quantities of pure water. Then she manufactures a large part of these materials into milk. Virginia has about half as many dairy cattle as beef cattle.

Dairying is the raising of milk cows and the production of milk, cream, butter, cheese, ice cream, and dried milk. This industry has become important in Virginia because the raising of dairy cattle fits nicely into any scheme of general farming and gives the farmer something to sell in addition to his crops.

Fig. A. Distribution of cattle (beef and dairy) in Virginia. Each dot represents 500 cattle.

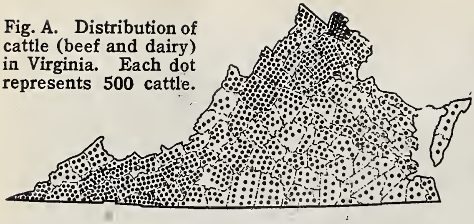


Fig. B. Distribution of hogs in Virginia. Each dot represents 500 hogs.

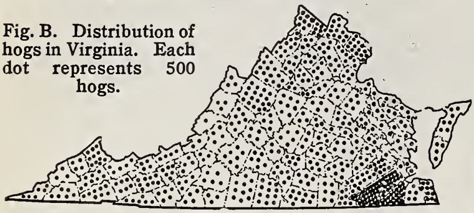
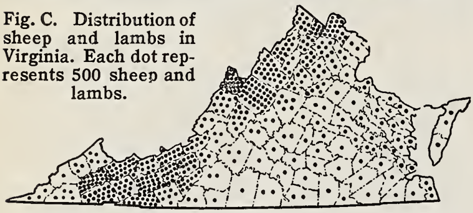


Fig. C. Distribution of sheep and lambs in Virginia. Each dot represents 500 sheep and lambs.



Sheep and lambs. Sheep are useful animals. They give two products a year, lambs and wool, and they cost much less to feed than do cattle. Figure 22-C shows that most of our sheep live west of the Piedmont in the Mountain-Valley section of the state. Staunton, Lexington, Abington, and Bristol are important centers for this industry.

Virginia ham. The Virginia hog is a "free soul" compared with his fellows who live in a great farming state like Iowa. Instead of being kept in pens and fattened, he is likely to roam the woods and meadows for most of the year. He gets his living from soy-bean pastures, pickings from the peanut fields, and a little corn now and then from his farmer-owner. This "razorback," as he may be called locally, gives us the famous "Smithfield Ham" in the peanut-producing country of southeastern Virginia and the "Virginia Ham" in other parts of the state. One packing house in Smithfield has been in the business of producing hams since about 1779.

Poultry. Poultry in Virginia includes the raising of chickens, turkeys, ducks, and geese. Chickens are by far the most important. Flocks are found on practically every farm. The care of the bird is ofttimes the duty of the farmer's wife and his daughters, who sell the delicious broilers, stewing chickens, good roasting chickens, and about 700,000,000 eggs a year, or approximately 300 for each person in the state.

THINGS TO THINK ABOUT

1. Distinguish between beef cattle and dairy cattle.
2. If you were a farmer in Virginia, what kind of farm animals would you raise chiefly? Give reasons only after you have thought carefully about the location of your farm.
3. "Corn goes to market on the hoof." What does this quotation mean?
4. Should hilly land be plowed for crops or kept under a grassy cover? Give reasons for your answer.
5. What is dairying?
6. From the "dot" maps in this book, locate our chief dairying district; beef and lamb district; hog district.

THINGS TO TALK ABOUT

1. The Smithfield ham.
2. "Virginia" ham, no matter where served, must be from porkers raised in Virginia.
3. How milk in our neighborhood is kept clean and as free of disease germs as possible.
4. Soil conservation.

THINGS TO DO

1. Have a school play in which talking farm animals give their opinions of life and living in the Old Dominion.
2. Prepare a poster advertising one or more of Virginia's famous animal products.
3. Pretend that you are a secretary of the Virginia State Chamber of Commerce. Write an article on the topic "Virginia's advantages for the livestock owner."

UNIT VIII—VIRGINIA'S WOODLANDS

Our forests primeval. When the first band of English settlers landed on the site of Jamestown, they found the country almost wholly covered with forests. In fact, over 95 per cent of the area included in the present State of Virginia was under tree cover. The tidewater lands had dense stands of pine, cedar, and a generous mixture of many other kinds of trees. Pines and cedars are called *conifers.* They bear cones and have needle-shaped leaves that keep green all year round. Sometimes they are called *evergreens.* Still another name for them is *softwoods.*

On the higher lands to the west of the Tidewater District, oaks, chestnuts, hickories, maples, walnuts, and other *hardwoods* were growing along with a generous sprinkling of softwoods. Most hardwood trees are *deciduous.* They shed their leaves in the autumn and grow new leaves in the spring.

We call this splendid forest our forest primeval. It had never been touched by the ax. But it was a great nuisance to the early settlers, for they had to cut down the trees and clear the land before they could have farms. This meant plenty of hard work.

Our forests today. As settlers continued to flock to the Old Dominion and as Virginia developed first as a colony, then as a state, more and more of the good forest land was cleared and planted in crops. Today only about 54 per cent of the area of the state is growing timber and some of that is nothing more than brushwood or fuelwood.

The forest lands which remain are found chiefly in two places: the higher-to-mountainous areas with steep slopes, and the wet land or poorly drained areas of the Tidewater District. Some of the

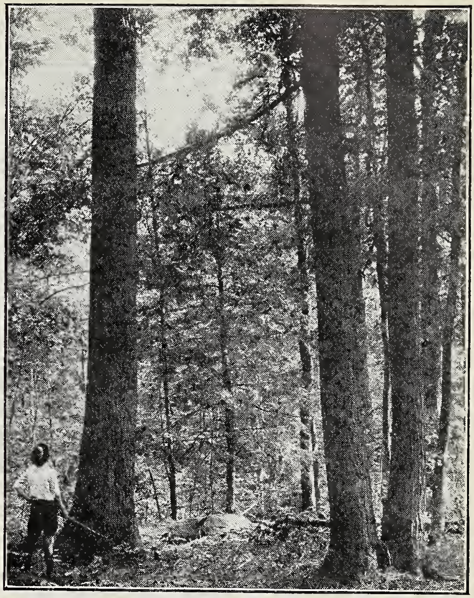


Fig. A. A stand of Virginia hemlock in one of Virginia's national forests.

forest land is in national or state forests under the best of care. Some of it, however, is "wild land." Nature is the principal forester and caretaker. She plants the trees and provides the heat, rain, and plant food for their growth. Then every so often she sends a windstorm to blow down some trees or lightning to cause a forest fire and burn the good timber. This is very wasteful, indeed.

Why care for forests? But why bother about forests, you may ask. The answer is that trees may be grown just as is any other crop. If planted and cared for, they will produce wood and other products which can be sold at a profit. The scientifically managed *Sihwald,* or city forest of Zurich, Switzerland, pays all the running expenses of the city, so that the citizens do not have to pay taxes.

This is called *scientific forestry.* A boy in your class now may study forestry when he is older. He will make his living

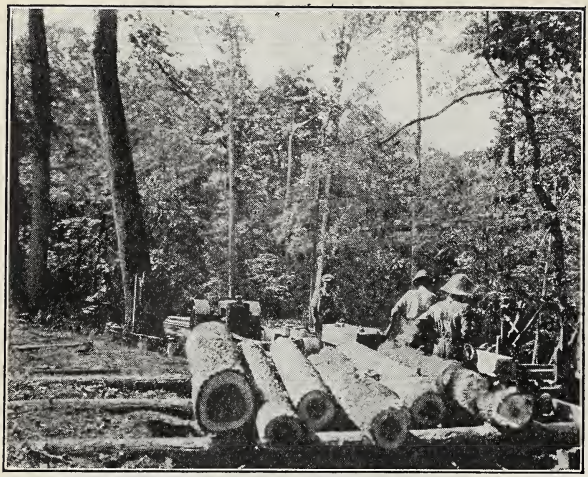


Fig. A. Tell what this picture shows.

growing and caring for trees. It is a good job.

Then, again, the leaves of the forest catch the pelting rain. The water trickles gently to the ground and soaks into the earth. The forest soil is much like a sponge. It holds the water and lets it go slowly to supply springs and streams. A river which has its source in a forest country seldom goes dry and seldom has a destructive flood. Forests, as we say, conserve the water supply.

Forests are a wilderness refuge for birds, animals, and other forms of wild life, also for humans who want to get away for a time from the hurry and bustle of their daily lives. People love to camp in the forests, to hunt, to fish in the streams, and to picnic among the trees.

Possibly you can tell how trees act as a windbreak, how they prevent the surface soil from blowing away, and how the tree roots hold the top soil and prevent it from washing away during a severe storm.

Forest enemies. Fire is the arch enemy of the forest, whether caused by lightning or by man's carelessness. Virginians must learn this lesson, because about $500,000 of valuable timber is destroyed by fire each year within the state. This waste does not include wounds to the trees by fire scars which offer a ready entrance for insects and fungus diseases.

State demonstration forests. A beginning has already been made in Virginia toward the proper care of our forest lands. The State Conservation Commission has recommended that demonstration forests be acquired in nearly every county.

Each demonstration forest will be managed by men who have studied forestry and who love trees. They will plant trees as trees should be planted in a forest. They will cultivate the trees as a farmer cultivates his crops. When a tree is ready for market, they will cut it down without injuring other trees near by. They will prevent forest fires.

The forester in charge of each demonstration forest will try to make his unit a perfect example of what a forest can and should be. Farmers who own wood lots and lumbermen who own large stands of timber will be invited to visit these demonstration areas and will be given advice and aid in improving their forest lands.

Aid from the forest service. Fortunately, the United States Bureau of Forestry is working with the Virginia Forest Service to protect our woodlands from forest fires, from disease, and from careless lumbering.

National forests. There are three national forests within the state. The Shenandoah National Forest, 450,000 acres, begins near Capon Springs in the Shenandoah Mountains and includes the entire Massanutten Range. The Natural Bridge National Forest extends about 100

miles southward from Waynesboro. In the far southwestern corner is the Unaka National Forest. In addition to the areas under the supervision of the Division of Forestry at Washington, the Virginia Forest Service has state-owned lands under tree cover or available for cultivation as forest areas.

The forest services regulate the amount and size of the trees felled in the national forests so that enough are left to provide seed for future forests. The forest services have also built fire towers with rangers constantly on watch. When fire is *spotted* from one of the lookouts, the location of the *smoke* is telephoned to the fire warden in the district, and a crew of fire fighters is sent out to battle with the flames.

Forest districts within the Old Dominion. Each of the natural districts of Virginia (Fig. 9-A) has a certain general type of forest growth which differs somewhat from the other natural districts within the state.

Tidewater Virginia is roughly 60 per cent in forest. Pulpwood (used in the manufacture of paper), railroad ties, and rough lumber are sold chiefly from this area.

The Dismal Swamp section has gum, juniper, white cedar, and a mixed growth of other trees. The land is privately owned and is rapidly being stripped of its forest cover. Severe forest fires occur here which might be prevented were more scientific methods of forestry practiced.

Piedmont forests. Some parts of the Virginia Piedmont are as much as 80 per cent under forest cover, especially the rougher sections to the south. Other parts, especially to the north, have as little as one third of the land in trees. The trees on this rolling upland are chiefly oaks, chestnut, walnut, gums, poplar, sycamore, maple, and pine. Rough lumber, ties, barrel staves, pulpwood, and excelsior are the chief forest products.

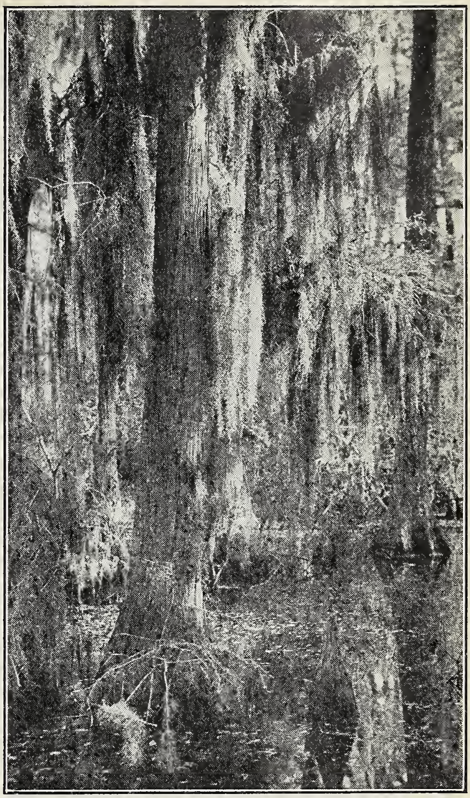


Fig. A. Draperies of Spanish moss hanging from the trees in Seashore State Park, Virginia Beach.

The Blue Ridge and the Appalachian regions. These rugged mountain areas have a higher proportion of land in forest than any other part of the state, and contain some of the best timber in the state. How are these forest lands being protected (page 24)? Here oaks, chestnut, and other hardwoods are found in great abundance. There is not much lumbering in these mountains, because most of the area is national forests, set aside as a vast timber reserve.

The Valley of Virginia. The fertile Valley of Virginia is far more valuable

Fig. A. Strange rock formations, like natural chimneys, in one of our natural forests.

for farms than for forests. Consequently, trees grow in the Valley only along streams and on the poorer and shallower soils. Hardwoods grow here, with some scrub pine and red cedar.

Future of Virginia forests. Whether Virginia's forests will be cut or burned faster than Nature can replace them, until our beautiful state is as devoid of tree cover as is China, depends on one thing—*scientific forestry*. In 1914, Virginia created the office of State Forester and made a beginning toward the proper care of the forest areas. The state forester works to protect the forests from fire, to educate our people in the value of tree cover, especially on steeper slopes, advises landowners on the care of their wood lots, distributes young trees for planting, and, as funds are available, will purchase and manage state forests. The Virginia Forest Service must be given more control over privately owned forests and over lands lying idle or those better suited to growing trees than producing crops.

THINGS TO THINK ABOUT

1. How much of our forest primeval remains?
2. What is the chief difference between the conifers and the deciduous trees?
3. Why is reforestation good business for private owners of forest lands? Why is it a good policy for state and national governments?
4. Why should forests be retained on steep slopes? on rough land?
5. What is "scientific forestry"?
6. What is the purpose of our "demonstration forests"?
7. In which forest district of Virginia do you live?

THINGS TO TALK ABOUT

1. Forests and the water supply.
2. Forests as playgrounds.
3. Forest conservation.
4. The National Forests within Virginia.
5. The work of the Virginia Forest Service.

THINGS TO DO

1. Find the name of at least one tree near your home or school.

2. Examine its bark, leaves, and general appearance, so that you can recognize its kind anywhere.

3. Begin a class collection of leaves of various kinds of trees. Press the leaves between the pages of a book. Then mount each leaf on cardboard with a legend telling all about it.

4. Write to the United States Department of Agriculture, Washington, D. C., or to the Virginia Forest Service, University of Virginia, Charlottesville, for copies of booklets descriptive of forestry conditions within the state. Both the state and national divisions of forestry have many booklets which they will be glad to send to you—but remember, one set of booklets only to your school. The departments could not hope to send booklets to every pupil.

Make a report on any one of the booklets which your class receives from the forest services.

5. Copy and complete the following chart about the forests of Virginia.

Name of District	Kinds of Trees

UNIT IX—VIRGINIA'S MINERAL STOREHOUSE

Our mineral wealth. Virginia is not a great mining state as is Pennsylvania. The Old Dominion ranks twenty-third among the states in mineral wealth, with products valued in 1933 at about \$20,000,000. Pennsylvania leads (\$422,000,000 in 1933) and Texas is second \$366,000,000 in 1933).

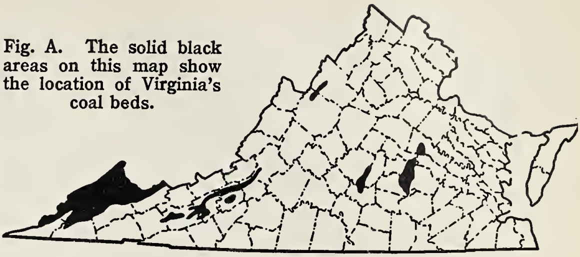


Fig. A. The solid black areas on this map show the location of Virginia's coal beds.

Virginia, however, has a great variety of useful mineral resources, more than 140 different kinds having been reported. Many of these minerals have never been mined to any great extent. They constitute a rich storehouse to draw upon as the population of the state and nation increases, and as new industries call for more and ever more raw materials.

The chief minerals produced in Virginia at the present time are coal, building stone, sand and gravel, clay, and lime. The Old Dominion leads all the states in the production of pyrites, used as a source of sulphur and in the manufacture of sulphuric acid, and has commercially valuable deposits of gold, iron, lead, zinc, gypsum, salt, and other minerals.

New mineral developments. Despite the fact that the first coal mined in the United States was from the thick coal bed along the James River near Richmond, in 1750, Virginia, as a state, seems just to be awakening to the possibilities of the development of her mineral resources. This is evidenced by the recent opening of a glass-sand quarry in Frederick County, the discovery of marble deposits of commercial importance in Giles County, the drilling for natural gas at several places in southwestern Virginia, and the erection of a large mill in Nelson County for the use of titanium minerals. Titanium is used in the manufacture of steel and as a pigment.

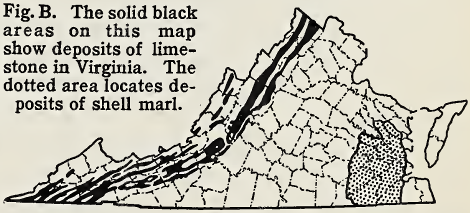


Fig. B. The solid black areas on this map show deposits of limestone in Virginia. The dotted area locates deposits of shell marl.

Coal. Coal accounts for more than half of the value of mineral products in Virginia. A little over 8,000,000 tons were mined in 1933. This compares with nearly 130,000,000 tons mined by Pennsylvania, the leader, and places the Old Dominion eighth in order of production among the states.

Virginia's coal comes chiefly from three major coal fields (Fig. 27-A): The "Richmond Basin" field lies about ten miles southwest of Richmond. This was the first coal field to be developed in the United States, and mining was actively carried on within the Basin for over 100 years. In recent years, however, mining operations have ceased for the most part.

The "Valley Field" lies on the west side of the Great Valley chiefly in Montgomery, Pulaski, Wythe, and Bland counties. This coal is semi-anthracite, of poorer quality than is Pennsylvania anthracite, but harder and much cleaner to handle than is bituminous. Valley coal is good for household purposes because it burns with very little smoke. Competition, however, with Pennsylvania anthracite has held down production.

The "Southwestern Virginia Field" is located west of the Valley in the extreme southwestern part of the state. This is the Old Dominion's greatest coal deposit. It is estimated to contain 30,000,000,000 tons of coal, or enough to supply the entire United States for a period of 60 years. From these fields comes the famous Pocohontas coal, one of the best coking and steam coals mined in the United States.

Building and ornamental stone. Virginia has a plentiful supply of building stone, some of which is of value for ornamental purposes. The Great Valley has beds of limestone of enormous thickness, from which can be taken all the limestone rock we need or are ever likely to need. This limestone is used for private dwellings, fences, retaining walls, and for public buildings. Buildings at the Virginia Polytechnic Institute and the State Teachers College at Harrisonburg are built of this stone.

The rock is also useful as road metal, railroad ballast, and in the manufacture of cement. Broken stone used for roads is called *road metal.* When it is used in making the bed for a railroad track, it is called *railroad ballast.* Virginia produces about 3,000,000 tons of limestone, and could produce unlimited quantities.

There is scarcely a county in the Great Valley that does not have kilns for the making of lime from limestone. The lime is used in the building trades and for agricultural purposes.

Virginia ranks fourth among the states in the value of slate produced. The chief quarries are in Buckingham and Fluvanna counties. The slate is used chiefly for roofing.

Virginia also has huge deposits of granite and sandstone. The granite comes chiefly from the Fall Zone and the sandstone from the western side of the Blue Ridge. Virginia granite was used for the State, War and Navy Buildings in Washington.

Valuable deposits of glass sand, produced by weathering from Virginia sandstone, are found in Roanoke and Frederick counties.

Virginia clays. Clay is a sticky kind of earth which hardens when it is baked. Bricks are made of clay, as are dishes, tile, some plumbing fixtures such as washstands, and many, many other useful articles. Even playing marbles are sometimes made of clay. High-grade clay deposits are found in all the natural districts of the state. Many of them have merely been located, not worked—a resource for the future.

Other mineral products. Virginia has many other mines—far too many to even list in a general geography textbook. Portland cement is made at Fordwick, Augusta County, and at Norfolk. Salt and gypsum are mined in Smyth and Washington counties. A tenth of the soapstone production of the United States comes from Amelia, Henry, Fairfax, Orange, Albermarle, and Nelson counties. Valuable iron deposits lie in the Ridge and Valley district and the mountains to the west. Even gold has been mined profitably in Virginia, the chief ore deposits being in the Piedmont district.

THINGS TO THINK ABOUT

1. What mineral products may be found in your community?
2. What is the chief mineral product of the Old Dominion? Where is this mineral found?
3. How many uses can you name for limestone? sandstone?. slate?

THINGS TO DO

1. Make a collection of different kinds of minerals found in your community. Label each specimen, telling where you found it and its kind. Be sure to include various kinds of stone.
2. Select one mineral produced in Virginia for a special report to your class.

UNIT X—VIRGINIA'S COMMERCIAL FISHERIES

Commercial fisheries. In this unit of work in your study of Virginia, you will learn something about our *commercial fisheries;* that is, fishing as a *business,* not as a sport.

Virginia, third among the states in the fishing industry. Virginia's commercial fishermen catch more fish than do the people of any other state except California and Massachusetts. The total catch in 1933 was:

California.......	707,000,000 pounds
Massachusetts ..	374,000,000 pounds
Virginia.........	*217,000,000* pounds
The United States	2,900,000,000 pounds

Appendix Table V, on page 52, shows the kinds of fish caught in Virginia waters and the annual value of the catch.

Fig. A. Each dot on this map represents fifteen men who are commercial fishermen. Why do they live chiefly along Chesapeake Bay and the Atlantic Ocean?

Why has the fishing industry become so important in Virginia? Suppose you were very tall, more than 500 feet tall. You could start at any place on the Chesapeake or Atlantic shore of Virginia and walk for miles out to sea before the water would come up to your chin. Then you would come to a sharp cliff, beyond which you could not walk, for the water would be very deep indeed. This strip of relatively shallow water along the Atlantic Coast of North America covers what is called the Continental Shelf. Fish like to live on such shelves where the water is not too deep and there is plenty of fish food.

Virginia, therefore, is one of the first three states of the United States in the fishing industry, because the Old Dominion has almost ideal fishing grounds in Chesapeake Bay and the shallow coastal waters.

Virginia's fisheries. Virginia's coastal waters have nearly twenty varieties of sea food of which the annual catch exceeds 200,000 pounds for each kind, and many other species which are taken in lesser amounts. The most important fish in order of value of catch usually are menhaden, shad, sea trout, croaker, alewives, bass, and butterfish; in order of quantity caught are menhaden, alewives, croaker, sea trout, shad, drum, and butterfish.

These commercial fisheries support, directly or indirectly, about 60,000 people, and bring millions of dollars into the state each year. The chief centers for the industry are Norfolk, Hampton, and Phoebus. The fish are rushed to market fresh, are frozen for shipment or storage, or are canned.

Catching fish in Virginia's waters. By far the largest number of fish caught in Virginia waters are caught either in *purse seines* or in *pounds.*

A seine is a large fishing net which hangs straight down in the water. It has sinkers at the lower edge and floats at the upper. Fishermen haul the net out to sea. They sight a *school;* that is, a large number of

Fig. A. Catching mackerel in the open sea. Look at the picture and then tell how the fishermen operate the net in order to catch the fish.

fish swimming together. Quickly they circle the net about the fish, pull a line attached to the lower edge of the net, and the net becomes a big saucer in which thousands of fish are swimming. Why do you think *purse seine* is a good name for this kind of net? In 1935 more than 115,000,000 pounds of menhaden were taken by purse seines in Virginia waters.

Pound fisheries. A *pound* is an inclosed place in which to put stray animals. This definition serves also for the *pounds* along the hundreds of miles of Virginia's coast, except that fish swim into fish pounds of their own free will.

The next time you are by the sea look closely at the water about half a mile out. You may see, here and there, groups of bare poles sticking above the waves. These poles are the tops of tree trunks sunk into the sandy bottom. To the poles is fastened a big net with a funnel-like opening. Poles and net together are called a *fish pound.* The sides of the pound are continued in each direction by rope nets which hang in the water like curtains.

Mr. Fish comes swimming along. He meets the rope-net curtain, swims along it, and soon finds himself inside the funnel opening of the big net. Try as he will, he cannot get out until the fisherman hauls up the net and dumps the fish into his boat.

There are at least 2000 such pounds in Virginia's coastal waters. They catch over 50,000,000 pounds of fish each year, chiefly alewives, sea trout, croaker, shad, and butterfish.

Menhaden. The name *menhaden* comes from an Indian word which had much the same meaning as our word fertilizer. The name was well chosen, because the larger part of the menhaden catch in Virginia waters is converted into fish scrap, meal, and oil at Reedville and several other places on the Chesapeake end of Northern Neck. Fish scrap and meal make excellent fertilizer. You will understand the extent of this industry when you remember that more than half of all fish caught in the waters of the Old Dominion or offshore are menhaden.

Shellfish. Shellfish are not fish at all. They are water animals with shells, such as oysters, clams, crabs, and scallops.

Oysters and clams. Oysters and clams are strange fellows. They do not like to travel very much. The clam loves to bury himself in the sands of bays and coves and to wait for some human to come along and dig him up. The waters of the lower Chesapeake, Tangier, and Pocomoke sounds and the ocean side of the Eastern Shore counties supply most of Virginia's clams.

The oyster, just after it is born, swims about for a week or two, then it attaches itself to almost anything it can find under the water: a rock, an old oyster shell, or the piling of a pier. The oyster is now called a *spat* or *seed oyster* and is quite willing to spend the rest of its life in this one spot, depending on the currents of water to bring food.

The part of the sea bottom where the young oyster lives with thousands and thousands of other young oysters is called a *natural oyster rock*, or, sometimes, an *oyster bed*. Such natural oyster beds in Virginia are the property of the state. The spats, however, may be sold to private interests. The oysterman who buys spats plants them; that is, he dumps them overboard in the shallow water of a bay or cove which he owns or rents. This is his *oyster ground*. No one may take oysters from an oyster ground except the man who owns or rents it. In from three to five years the oysters are ready for market.

Too many spats, however, are being sold from the natural oyster rocks to oystermen, and too many large oysters go from the state beds to the city markets. Little or no effort is being made to return the oyster shells to the "rocks" in order that the very young oysters, swimming about, may have something to which to attach themselves. As a result, oyster production in Virginia is declining.

Other reasons for the depletion of the oyster beds are the pollution of the streams by sewage from large cities, and the competition between Maryland and Virginia for the oyster business. In order to preserve Virginia's great oyster industry, oysterman and city man must work together to free our streams and coastal waters from pollution, and Maryland and Virginia must work together to protect the natural oyster rocks from destruction.

Virginia and New Jersey are leading states in the oyster industry. The chief oyster centers of the Old Dominion are in the Northern Neck, on the Rappahannock, the Virginia tributaries of the Potomac, and at Chincoteague, Wachapreague, Willis Wharf, and Tangier.

Crabs and other shellfish. Virginia crabs come chiefly from the coastal waters about Northern Neck, the lower Chesapeake area, and the sounds of the Eastern Shore. The principal packing and shipping point is Hampton. Scallops, another delicious sea food, come chiefly from the ocean side of the Eastern Shore.

THINGS TO THINK ABOUT

1. Why has Virginia a great sea-food industry?
2. Why is a fish pound a good device to make fish catch themselves?
3. What is a school of fish?
4. What are shellfish?
5. What use is made of menhaden?

THINGS TO TALK ABOUT

1. Clean streams—good fishing.
2. Oyster culture.
3. Co-operation in the fishing industries in Virginia.

THINGS TO DO

1. Select one kind of sea food taken in Virginia's coastal waters. Look up facts concerning the life history of the fish which you select and write a story. Call it "The Life Story of a ——."
2. Draw several pictures to illustrate the operation of a purse seine.

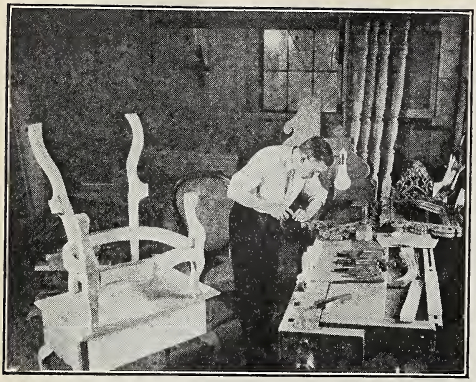


Fig. A. Making reproductions of antique furniture at a factory in Richmond.

UNIT XI—MADE IN VIRGINIA

Advantages of Virginia for manufacturing. Virginia offers many advantages to new industries seeking favorable sites and to established industries seeking location for branch factories. Here are some of the advantages:

Climate. A climate seldom too hot and seldom too cold makes people active, eager to work; or, as we say, *energetic.* Such a climate can be found in all parts of the state. The relatively mild winter near the coast and in the south helps to reduce living costs to the Virginia workman. He can afford to work for smaller wages than his fellow workers in the states to the north and enjoy just as many comforts, because he pays less for needful things.

Power. Virginia has all the coal that its industries can use and at a price much lower than coal of similar quality can be purchased in some of the other large industrial areas of our country. Virginia has fuel oil delivered at low cost by tank steamers to Hampton Roads. Virginia has water-power plants, as you recall from pages 13–14, with more sites available as the need arises.

Raw materials. Raw materials are products not manufactured, treated, or prepared. An apple is raw material. An apple pie is a manufactured product. Virginia has an unusually large variety of raw materials—agricultural products, forest products, minerals, fishery products, and fuels. In fact, the people of Virginia supply more of their own needs from the products of their own state than do the people of any other state.

Markets. People who buy Virginia-made goods are our *customers.* The regions or places where these people live are our *markets.* These markets are world-wide because of the location of the state at tidewater on the Atlantic (page 1). The home market also is large, for within 500 miles of Richmond live nearly 60,000,000 people, almost half the population of the United States.

Good transportation. After goods are manufactured, they must be marketed. This requires some kind of carrier, of which Virginia has a goodly supply. A dozen Class I railroads serve Virginia, as well as coastwise and overseas steamers, buses, trucks, and air lines (pages 34–37).

The "Big Ten" in Virginia. Virginia has more than 2000 factories. They make so many different products that to list them by name would require several pages of a book of this size. The ten leading industries (1933), with value of products are:

Tobacco industries	$170,830,768
Rayon and allied products	36,980,519
Paper and pulp	25,276,415
Cotton goods	19,949,417
Chemicals, etc	18,833,179
Car construction and general shopwork, etc., steam railroads	16,396,726
Furniture	16,280,610
Clothing, men's	11,688,384
Fertilizers	10,077,709
Knit goods	9,058,425

About two fifths of Virginia's manufactures, by value of products, are made in Richmond. Another fifth comes from

Norfolk, Roanoke, Lynchburg, and Petersburg. The remaining two fifths are produced in Newport News, Portsmouth, and the smaller cities and towns of the state.

Tobacco. Tobacco products, chiefly cigars and cigarettes, usually account for about a fifth of the value of all manufactures in Virginia. Richmond is the largest center for this industry. Important tobacco factories are also located in Petersburg, Norfolk, Harrisonburg, and Martinsville.

Textiles. Textiles are fabrics which have been woven or knitted, such as cotton goods, silks, and woolens. If you will turn to the table on page 32, you will find that textiles are listed among the "Big Ten" manufactures of Virginia, as rayon, cotton goods, men's clothing, and knit goods.

Rayon resembles silk but is stiffer and not so strong. It can be manufactured from the woody part of almost any plant or tree. Virginia's forests supply the raw materials for the rayon industry and are the chief reason for the leadership of the Old Dominion in this industry. Virginia's mills produce almost a third of all rayon manufactured in the United States.

Forest products. Virginia's forests are also the basis for our huge paper and pulp industries and our furniture factories. The Old Dominion accounts for a third of all the paper manufactured in the South, and the industry is growing rapidly.

Furniture manufacture is another factory industry which seems to thrive in the Old Dominion. Over ninety per cent of our product is wooden household furniture, in which Virginia ranks sixth among the states.

Fertilizer. Virginia stands fourth among the states in the fertilizer industry, ranking after Georgia, Maryland, and North Carolina. Norfolk County is the center for

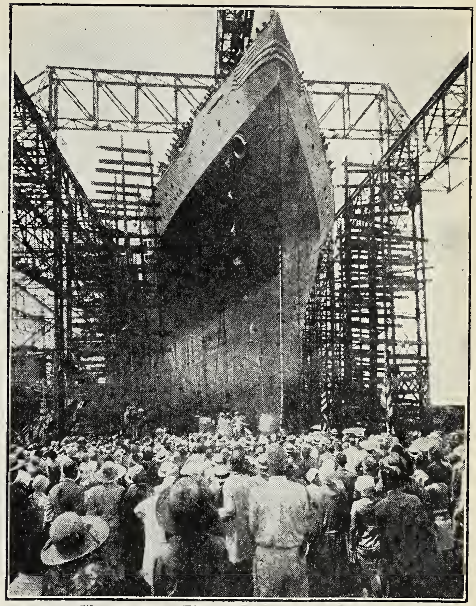


Fig. A. Launching the steamship, *Virginia*, at a shipyard at Newport News.

this industry. Probably you can tell how our large catch of menhaden is related to our leadership in the production of fertilizer. Virginia also has factories for taking nitrogen from the air and for the manufacture of nitrates—one of the necessary foods for plants.

Gazetteer of cities. This book is not large enough to tell about all of Virginia's manufactured products and industries. There are so many factories and they make so many different products. The Gazetteer of Cities of 5000 population and over (pages 43–47) tells about some of these industries in connection with the description of each city.

THINGS TO THINK ABOUT

1. What are Virginia's advantages for manufacturing?

2. How does variety of raw materials aid in its manufacturing? Consider in your answer the following groups of raw materials:
   a. crops b. forest products c. fisheries
   d. animal industries e. minerals

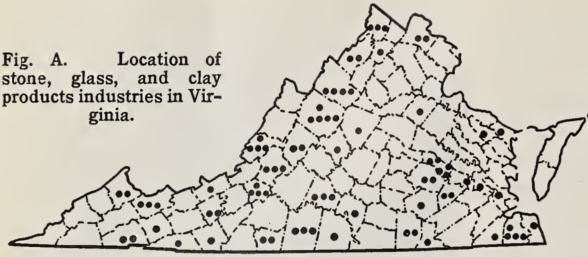


Fig. A. Location of stone, glass, and clay products industries in Virginia.

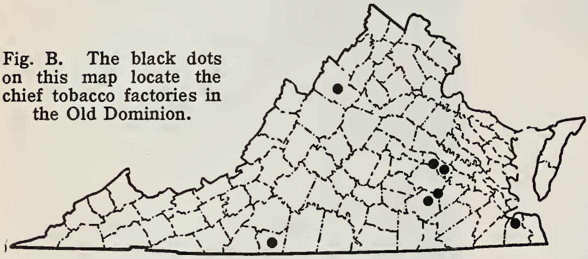


Fig. B. The black dots on this map locate the chief tobacco factories in the Old Dominion.

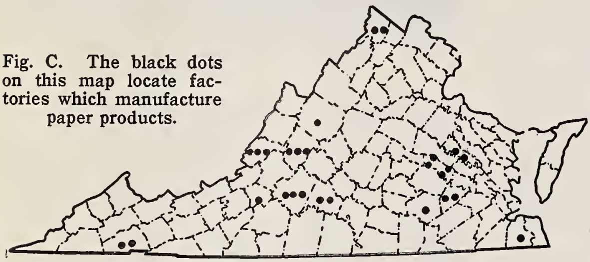


Fig. C. The black dots on this map locate factories which manufacture paper products.

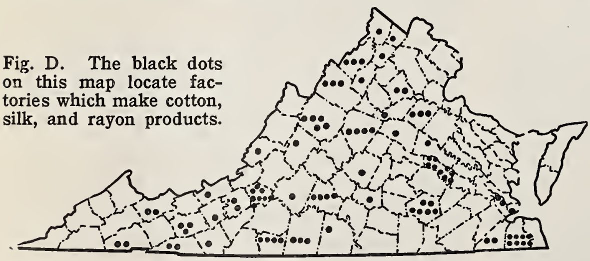


Fig. D. The black dots on this map locate factories which make cotton, silk, and rayon products.

THINGS TO DO

1. Sketch an outline map of Virginia.
2. Locate on this map each city of 5000 population or over.
3. Beneath the map write the most important industry in each city. (The Gazetteer, pages 43–47, will help.)
4. Find out how some Virginia product is made and write a story about it.

UNIT XII—HOW WE GET ABOUT FROM PLACE TO PLACE IN VIRGINIA

Virginia's means of transportation. To transport is to carry from one place to another. Organizations which make a business of carrying people and goods are called *transportation agencies*. We have a large number of such agencies in Virginia. They carry by sea lane or river route, by railway, by highway, and by airway.

Hampton Roads. This harbor is formed by the meeting of the James, the Nansemond, and the Elizabeth rivers with Chesapeake Bay. It has a shore frontage of about 50 miles and a depth of at least forty feet at low water. This is deep enough to float all ships except the very largest express and passenger liners.

There are more than fifty regular steamship lines which link the cities about Hampton Roads with the British Isles, continental Europe, the Mediterranean, Latin America, Australasia, the Pacific coast of the United States, and the Far East.

Service is also provided by coastwise steamers to New York, Boston, Providence, Philadelphia, Jacksonville, Miami, West Palm Beach, Houston, Galveston, New Orleans, and Mobile; by Chesapeake Bay steamers to Baltimore and Washington; and by river steamers to Richmond on the James, West Point on the York, and Fredericksburg on the Rappahannock.

The port of Norfolk. On the south side

Fig. A. In the foreground of the picture is the inner harbor at Norfolk. In the background is Hampton Roads. Compare the picture with the map on page 13.

of this harbor is the port of Norfolk (comprising the cities of Norfolk and Portsmouth) and on the north side the port of Newport News. These ports have over 200 piers and docks for ships. They have ample storage and warehouse facilities, grain elevators, oil storage plants, and other equipment used in handling a huge traffic by rail and by water. Within the harbor area also are the Norfolk Navy Yard, an army supply base, and Fort Monroe.

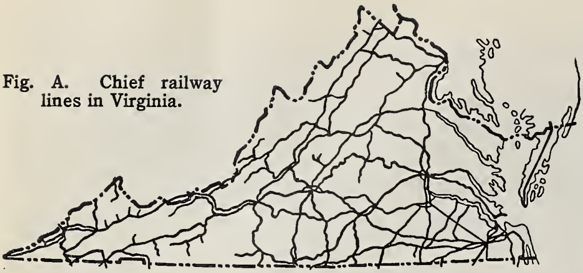
In 1934 the ports of Hampton Roads handled 18,000,000 tons of cargo, 15,500,000 tons outbound and 2,500,000 tons inbound. By far the largest item of export was leaf tobacco and cigarettes. Other important exports were coal, cotton-piece goods, cotton linters and waste, lard, and apples.

The principal imports were sugar and molasses from Cuba, jute products from British India, bananas from Central America, paper products, cattle hides, coffee, and quebracho extract for tanning.

Railways and terminals. The first railroad in Virginia was built in 1828 to haul coal from Chesterfield County to tidewater. Gravity provided some of the power to pull the trains, and mules supplied the rest of the power. Today, the railroads of the Old Dominion serve every county except ten counties on navigable waterways, and Rappahannock, Greene, Madison, Highland, and Floyd counties. The map (Fig. 36-A) shows the larger railroads. What road serves your community? Notice again (Fig. 36-A) how these railroads converge at Hampton Roads and how they radiate as the spokes of a wheel from Richmond, Lynchburg, and Roanoke.

Freight terminals. Before you read the following paragraphs, be sure to look carefully at Figure 295-A. It shows a railway freight terminal at the Hampton Roads end of one of the great railroads of the United States. A railroad freight terminal is little more than a station, shed, and tracks at each end of the line. But there are at least eight busy roads which reach

Fig. A. Chief railway lines in Virginia.



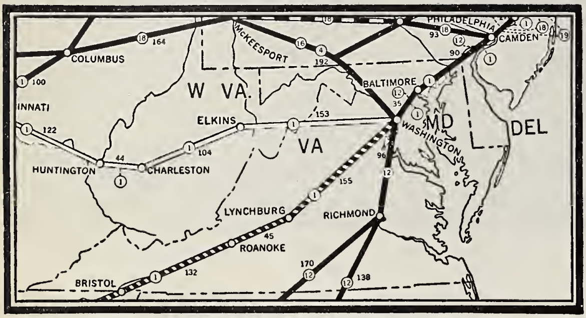


Fig. B. Commercial air lines serving Virginia.

tidewater in the lower Chesapeake district (Fig. 36-A). They carry so much freight that they need several terminal yards each to handle the thousands of freight cars moving in and out every day.

These yards are on the flat lands bordering Hampton Roads. Probably nowhere else in the world are there so many except along the Jersey shore of the Hudson opposite New York City.

Some of the yards separate the loaded cars of a freight train and use switching engines to pull one car here and another car there. Some yards sort out empty freight cars and make up trains to return to various parts of the country. Some yards are icing stations. They pack ice into the ends of freight cars that are loaded with fruit, vegetables, meats, and other products which must be kept cool.

Some yards have *ship-to-train* delivery. Tracks are laid on piers out into the water. A ship draws up alongside the pier and loads or unloads directly to the train. Some yards have *train-to-truck* delivery. Roads are built so that motor trucks can back right up to the open door of the freight car.

Perhaps you wonder where all these freight cars have come from and where they all are going. When you remember, however, that Hampton Roads in some years ships out more *tons* of freight than any other port in the Western World and that this freight originates in many other states besides Virginia, you will understand the cause of all the hurry and bustle in our port cities.

Virginia's highways. Virginia has good roads. This is the testimony of all automobilists who have traveled through the Old Dominion, either on business or as visitors to our sea and mountain resorts, our natural wonders, and our historic shrines.

Figure 37-A shows one of the main highways of Virginia. It is a state highway; that is, it was built by our state government through its highway department. The money came from taxes, chiefly the gasoline tax, and from Federal aid. Virginia's highways form one of the most complete networks of hard-surfaced roads to be found in any state. They pass through every county and connect all the larger cities and towns.

Truck freight service over these highways reaches nearly every part of the state, and passenger buses serve every city and town of importance. Virginia's good roads also add to the enjoyment of the thousands of visitors from other states who visit the Old Dominion each year. Caring for these people is one of Virginia's growing

industries. Good roads bring more visitors and make more business for our garages, hotels, roadside markets, restaurants, and tourist homes.

Airways. As you see from Figure 36-B, Virginia's airways radiate from Washington. One line flies due west. A second line flies southwest through Lynchburg and Roanoke. A third line flies due south to Richmond, then branches, one route to New Orleans and the other route to Miami. At Richmond is the Richard E. Byrd Flying Field. Other Virginia cities also have landing fields as listed in the Gazetteer (pages 43-47).

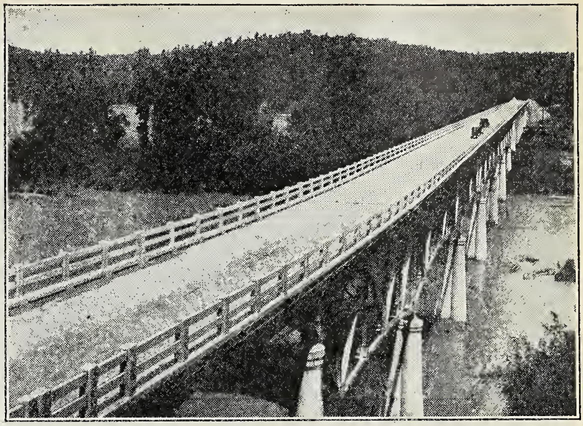


Fig. A. This bridge, completed in 1934, carries one of our state highways across the James River.

THINGS TO THINK ABOUT

1. Why do we say that Virginia is well situated for trade with all the world?
2. What advantage have the ports of Hampton Roads over the Port of New York in trade with South America? in trade through the Panama Canal?
3. Name the ports about Hampton Roads.
4. Why are ten tidewater counties not served by railroads?

THINGS TO TALK ABOUT

1. Highways and the tourist industry.
2. Railways and the development of the motor truck.
3. Airways of Virginia.

THINGS TO DO

1. Draw a picture of an inland city which has good trade because of excellent transportation facilities.
2. Do the same for a port city.
3. Draw a picture of the lower Chesapeake area and Hampton Roads. Show the port cities. Tell from your picture why this area is a good harbor.
4. Draw a simple picture of a freight terminal such as may be found near Hampton Roads.
5. Draw a picture of a harbor and a port.

UNIT XIII—VIRGINIA'S PLAYGROUNDS AND WILD LIFE

The tourist business. One of the large and growing industries in Virginia is the tourist business; that is, caring for guests who come for a visit to our beaches, our state parks, our national parks, our natural wonderlands, and our historic shrines. These main points of interest in the Old Dominion have been listed for you in Statistical Table II, page 51. Which point of interest is nearest to your home?

Virginia's beaches. A large number of Virginia's guests, together with thousands of our own people, visit our beach resorts. Nature must be given some credit for this. She built a very gently sloping, sandy beach all the way from Willoughby, a few miles east of Norfolk, through Ocean View, on Chesapeake Bay, to Cape Henry and Virginia Beach on the Atlantic Ocean.

Each summer Nature brings to the Virginia shore resorts weather several degrees cooler than that of the lowlands in the same latitude inland from the beach. Why is this? Mild weather, combined with salt air, sea breezes, and the restless ocean provides health, recreation, and a change to the city dweller and the visitor

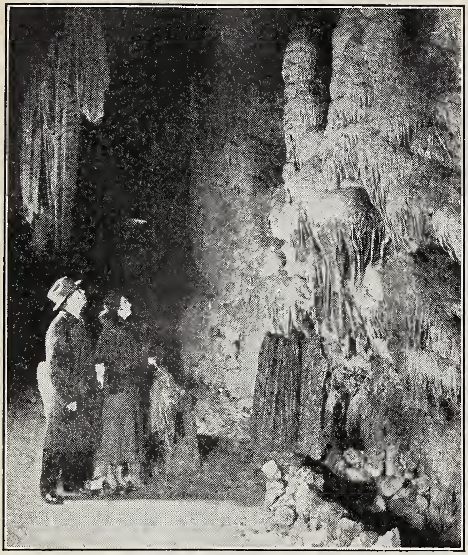


Fig. A. The "Mosque," a formation made by dripping water depositing limestone in one of the caverns in the Shenandoah Valley.

from the interior. Virginians as a people should know more about their ocean beaches and the opportunities for surf bathing, salt- and fresh-water fishing, yachting, hunting, and other sports which these beach resorts offer. Virginia beaches have all the attractions of the famous Jersey beaches and are nearer home.

Virginia's state parks. Virginia has six state parks under the supervision of our State Commission on Conservation and Development.

Seashore State Park. This park is located on the site where the first English settlers landed, April 26, 1607, before they proceeded to establish the first permanent English settlement in America at Jamestown. Within the park area are bathing beaches, coves, and back bays made to order for fishing, crabbing, and boating, marvelous sand dunes, and a wooded country in which nearly every kind of tree known in America may be found.

Westmoreland State Park. Situated in one of Virginia's most historic sections, Westmoreland State Park is on the Potomac River and Chesapeake Bay in Westmoreland County. Here are a splendid bathing beach and tree-covered cliffs by the water's edge. Immediately to the south is the homestead of General Robert E. Lee, and to the north, the ancestral home of George Washington.

Douthat State Park. This is a mountain-forest park in the Allegheny Mountains of Bath and Alleghany counties. The mountains here rise to a height of 4280 feet and form a wonderland of virgin timber, wild flowers, tumbling streams, and beautiful mountain lakes.

Fairy Stone State Park. This park, in the Blue Ridge Mountains of Patrick County, takes its name from the curious formations known as *fairy stones,* so often used as charms, that are found in this region. Here are rugged, forest-covered mountains and a large mountain lake.

Staunton River State Park. In the Halifax County section of the Piedmont, in the heart of the Virginia tobacco belt and at the joining of the Dan and Staunton rivers is Staunton River State Park. An island at this point was used as a trading post by the Occaneechee Indians. The park attracts campers and those who like to swim. Here has been constructed the largest swimming pool in the state.

Hungry Mother State Park. This park is located in the mountains of Smyth County in southwestern Virginia. Here are a beautiful artificial lake and high, wooded, mountain country for those who love to live out-of-doors for a time—to boat, fish, swim, and to enjoy Nature at her very best.

National parks and monuments. The largest national park project in Virginia is Shenandoah National Park. The land for the park, deeded by the State of Virginia

to the National Park Service, lies in the northern part of the Blue Ridge. Here is the famous Skyline Drive along the crest of the ridge. Here also are high, wooded mountains with accommodations for hunting, fishing, and camping in the great out-of-doors.

The Fredericksburg and Spotsylvania County Battlefields Memorial National Military Park and the Petersburg National Military Park were set aside by Act of Congress to commemorate military operations during the War Between the States and to preserve breastworks, earthworks, and defenses used by the armies in battles.

National monuments. A national monument is usually smaller than a national park and generally contains but one example of Nature's handiwork or one spot of historic interest.

The George Washington Birthplace National Monument contains the plantation where John Washington settled in 1665. Here, his son, Lawrence, his grandson, Augustine, and his great-grandson, George, were born. The old family homestead, Wakefield, has been restored.

The Colonial National Monument includes Jamestown Island, parts of the city of Williamsburg, the Yorktown Battlefield, and a parkway connecting the three points. The purpose of the monument is to preserve for the enjoyment of all our people the site of the first English settlement in America, the scene of the surrender of Cornwallis to Washington which brought to a close the War for Independence, and historic parts of the city of Williamsburg, capital of Virginia from 1699 to 1779. The most historic parts of this old colonial city have been restored to their appearance in George Washington's time.

Fig. A. Natural Bridge, Virginia.

Natural wonderlands. Virginia has more natural wonderlands of great interest to travelers than has any other state east of the Rocky Mountains. Probably the most famous of these wonders is Natural Bridge (Fig. 39-A), Rockbridge County. This limestone arch, 215 feet high, "spans a river, carries a highway, and makes two mountains one." Plan to visit it sometime.

The caverns. Of limestone caverns Virginia has a great many. We have Giant Caverns in Giles County, Dixie Caverns in Roanoke County, Grand Caverns in Augusta County, Luray Caverns in Page County, Massanutten Caverns in Rockingham County, Narrow Cavern in Giles County, and the Endless and Shenandoah Caverns in Shenandoah County. These caverns have stalactites and stalagmites, beautifully colored rooms, halls, and corridors formed by running water underground dissolving away the limestone rock.

Virginia's historic shrines. Some of these shrines, as you have learned, have become state parks, national parks, or national monuments.

Fig. A. The birthplace of George Washington, in Westmoreland County, Virginia.

These historical sites are located by name on the "Virginia Historical Map," to be had by any school from the State Commission on Conservation and Development at Richmond. The shrines are described in detail in the booklet *Virginia—Historic Shrines and Scenic Attractions*, to be had by any school from the Virginia State Chamber of Commerce at Richmond. Possibly your school library has both of these booklets for reference as you study this unit of your Geography of Virginia.

THINGS TO THINK ABOUT

1. Why should taxes be levied for the upkeep of state parks, national parks, or national monuments?
2. What advantages have the Virginia beaches over the Jersey beaches?
3. From the description in your text, which of the state parks of Virginia would you prefer to visit? Why?
4. Why will Shenandoah National Park be of value to business in Virginia?
5. What is a national monument?

THINGS TO TALK ABOUT

1. Virginia's tourist business and how we can develop it.
2. Virginia's national wonders have a dollar and cents value.
3. Why visit Virginia?

UNIT XIV—HOW WE ARE GOVERNED IN VIRGINIA

Our state government. At the head of the Virginia state government is the governor. He is elected by popular vote for a term of four years. He becomes governor, or as we say, he takes office on the third Wednesday in January. He may not succeed himself; that is, he may not be governor again immediately after his first four years of service are over. The governor is chief of the executive branch of our government. He has many duties, among which is the supervision of the twelve departments which see that the laws of the state are carried out. The Department of Education is one of these departments, as is the State Highway Department.

The General Assembly. The men and women who make the laws for Virginia constitute our General Assembly. It is divided into two groups: the Senate and the House of Delegates.

The Senate, 40 in number, is elected every four years. The House of Delegates, 100 in number, is elected every two years. The two *houses*, as they are called, meet every two years, beginning on the second Wednesday in January. The session lasts sixty days, but may be extended for an additional period.

Virginia's courts. Virginia's courts of justice tell us what the laws mean. They also settle disputes between people, and try anyone accused of doing wrong. The highest court in Virginia is the Supreme Court of Appeals. Virginia has many other courts, such as circuit courts and city courts. Possibly you know the justice of the peace in your community. He is a law officer.

Local government. Each of the 100 counties of Virginia has its Board of Supervisors. These boards take charge of county affairs. The counties, in their turn, are divided into districts. Each county has its county officers, such as county clerk and county treasurer. In what county do you live? what district?

Counties also have subdivisions called *towns* or *cities*. A town is an incorporated community having less than 5000 people. A city is an incorporated community having more than 5000 people. Some towns in Virginia, however, have over 5000 people and at least two cities have less than 5000. Virginia cities are further classified into cities of the first class, 10,000 or over, and cities of the second class, 5000–10,000. Both cities and towns have a large measure of local government. The people of the towns usually elect their own town council and the cities elect a mayor and council to administer affairs.

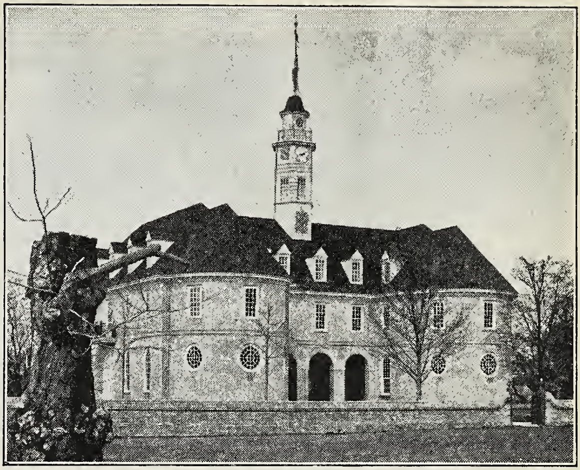


Fig. A. The Capitol of Virginia during colonial times. This beautiful building, which has been restored to its original condition, is at Williamsburg.

THINGS TO THINK ABOUT

1. Who is the governor of Virginia?
2. Who is the senator from your senatorial district?
3. Who represents your community in the House of Delegates?
4. Do you live in a town, a city, or a rural district?
5. What is the name of your local community? How did it get its name?

THINGS TO TALK ABOUT

1. How our neighborhood is governed.
2. How our county is governed.
3. How our state is governed.

THINGS TO DO

1. Organize your class as the House of Delegates. Make laws for the class.
2. Do this also for your county government, township, or city government.
3. Make a chart to illustrate the governments in Virginia.

UNIT XV—VIRGINIA'S SCHOOLS

Virginia—a pioneer in education in America. Virginia, first of the English colonies in America, was also first to lay emphasis on the importance of education. As early as 1619 funds were collected and 10,000 acres of land were set aside for the establishment of a college for Indians and colonial youth at Henrico on the James River. This first effort to establish higher education in America failed, but a second attempt in 1693 resulted in the founding of the College of William and Mary at Williamsburg.

Free public education also got its start in the Old Dominion under the will of Benjamin Syms, dated 1634. He provided funds for the establishment of a free school in Elizabeth City County. This school was the pioneer of the school which you now attend and all other public schools in the United States.

Our public schools. Virginia has approximately 600,000 boys and girls in the 4900 public elementary schools and 600 public high schools. This large army is under the direction of the State Board of

Fig. A. The main building of Washington and Lee University at Lexington, Virginia.

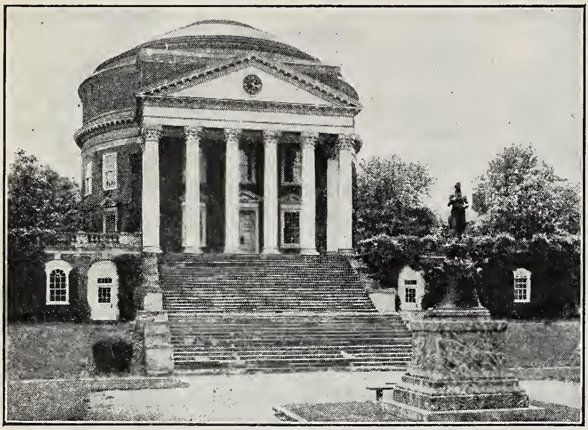


Fig. B. The Rotunda at the University of Virginia.

Education and the State Superintendent of Public Instruction, both appointed by the governor.

Our private schools. In addition to our public elementary schools and high schools, Virginia has a large number of private preparatory schools, probably more in proportion to the population than has any other state. About a dozen of these are military academies, headed by the Staunton Military Academy at Staunton, in the Shenandoah Valley. About fifty other private schools offer the best possible kind of education to boys and girls who do not attend the public schools.

Virginia's teachers colleges. In order to have teachers for our public elementary and high schools, the State Board of Education has four teachers colleges. They are located at Farmville, Harrisonburg, Fredericksburg, and East Radford. In addition there is a state college for Negroes at Petersburg.

Virginia's colleges. At Charlottesville is the University of Virginia, founded by Thomas Jefferson and said to have the most beautiful campus of any college or university in the United States. Other state institutions of higher education, other than our teachers colleges, are the College of William and Mary, the Virginia Military Institute at Lexington, the Virginia Polytechnic Institute at Blacksburg, and the Medical College of Virginia at Richmond.

Virginia also has many famous private institutions for education after high school. The best known of these, probably, are Washington and Lee University at Lexington, and Hampton Institute for Negroes at Hampton.

THINGS TO THINK ABOUT

1. What school do you attend?
2. Is it a public or a private school?
3. How is the money provided to operate the school?
4. How do the members of your local school board get their offices?
5. How much do *you* cost your board of education?
6. Under what conditions may a Virginia boy or girl attend the State University?

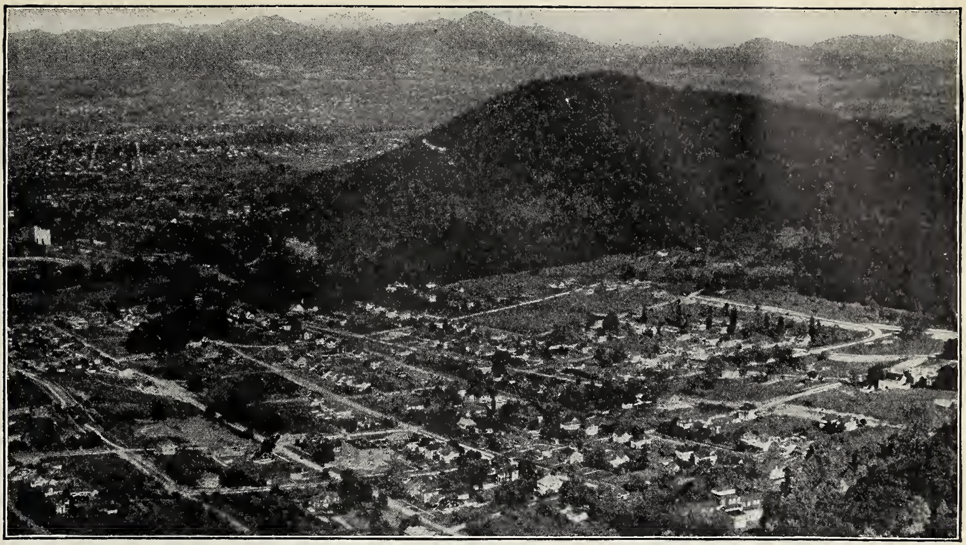


Fig. A. Roanoke, Virginia. You are looking across the southern part of the city toward Mill Mountain and the Blue Ridge.

*GAZETTEER OF CITIES AND TOWNS OF 5000 POPULATION AND OVER

ALEXANDRIA (F-3), (24,149), (3 airports; Potomac River; A. C. L., B. & O., R. F. & P., Sou., S. A. L., Pa. R. Rs.; bus lines; boat lines), was established in 1749 and became one of the main colonial trading centers. Today, it is important as a manufacturing center and as a historic shrine. Its chief manufactured products are refrigerator cars, fertilizer, silk thread, and machinery. Lying on the highway from Washington to Fredericksburg and thence to Richmond, Alexandria is close to Mount Vernon. The many places of historic interest within the city itself are of nationwide interest. These include Christ Church, where both George Washington and Robert E. Lee worshiped and the Carlyle House, where Washington was often entertained.

BRISTOL (A-5), (8840), (airports; Sou., N. & W. R. Rs.), a twin city, is located on the line dividing Virginia and Tennessee. This city, which is the hub of the southwest Virginia and east Tennessee section, has been for many years an important jobbing center and a distributing point for agricultural products. The chief manufactures of the city and surrounding territory include paper and pulp, leather belting, mine cars, veneers, overalls, furniture, paper boxes, and structural steel. Bristol is in a region producing large quantities of iron ore and, like her namesake in England, is an important center in the iron industry. There are three colleges here—Sullins College and Virginia Intermont for girls, and King College for men. The city is located in the heart of the Unaka National Forest Reserve which affords splendid recreation.

***CHARLOTTESVILLE** (E-3), (15,245), (airport; Sou., C. & O. R. Rs.; bus lines), named for Queen Charlotte, wife of George the Third, was established in 1762. It is in the foothills of the Blue Ridge, at the southern gateway to the Shenandoah National Park. It is an industrial city in a historic setting. Its manufactured products include woolen cloth, silk, flour, meal, and dairy products.

Charlottesville is in the heart of historic

* For the facts in this gazetteer we are indebted chiefly to the Chambers of Commerce of the various cities and towns. A map finder which refers to Figure 2-3-A, the population in 1930, and the chief transportation agencies are given directly after the name of each place. Names of county seats are preceded by an asterisk.

Virginia. Here are Monticello, designed and built by Thomas Jefferson, and Ash Lawn, the home of James Monroe for twenty-six years. The University of Virginia lies close to the city's business district.

CLIFTON FORGE (D-4), (6839), (C. & O. R. R.), was named after an old iron forge which stood on the site in early days. It is an important railroad town and includes among its industries railroad repair shops, foundry and machine shops, wood-working plants, and a flour mill; and dairy and truck farming in its immediate vicinity.

***COVINGTON** (D-4), (6538), (C. & O. R. R.), is on the Jackson River in one of the most beautiful valleys of Virginia. It lies between important iron and coal fields which add to its commercial importance. Its industries include paper, pulp, rayon, and silk mills; bleach extract and chalk factories; a leather tannery; and coal and iron mining.

DANVILLE (D-5), (22,247), (airport; Sou., D. & W. R. Rs.; buses), lying on both sides of the Dan River, is in the center of a large agricultural district in which the principal crop is bright, flue-cured tobacco. Danville is one of the largest bright-leaf tobacco markets in the world. Here, too, are said to be the largest cotton mills in the South. Among the city's manufactured products are cotton goods, sheeting, hosiery, broad silks, overalls, elevators, flour and feed, tobacco, fertilizer, and millwork.

Danville, which gets its name from the Dan River, was named by Colonel William Byrd II. The city was incorporated in 1793. Here is the "last White House of the Confederacy" used by President Jefferson Davis as a residence until Lee's surrender.

FREDERICKSBURG (F-3), (6819), (airport; V. C., R. F. & P. R. Rs.), situated at the fall line on the Rappahannock River, was recognized as a town as early as 1671. It was named for Frederick, Prince of Wales, father of George II of England. As it was easily reached by ocean vessels, it was a town of commercial importance in colonial Virginia. Today Fredericksburg is the outlet for a large agricultural region specializing in truck farming, dairying, and poultry. It manufactures clothing, transparent paper, shoes, silk thread, and metal egg crates.

Fredericksburg is of great interest historically. Here are shrines and battlegrounds of the War Between the States, and here, too, are the Mary Washington House, Monroe's Law Office, and the home of John Paul Jones. A State Teachers College is here.

***HAMPTON** (G-4), (6382), (airport; C. & O. R. R.; ferry to Norfolk), is situated on Virginia's great natural harbor, Hampton Roads. It is the oldest English settlement in continuous existence in the United States, and its present school system is a continuation of the oldest free school in America. The city is one of the greatest crab, oyster, and fish centers on the Atlantic Ocean. Hampton Institute for Negroes and Indians, located here, is one of the most outstanding institutions of its kind in the United States.

***HARRISONBURG** (E-3), (7232), (Sou., C. W., B. & O. R. Rs.; buses), founded in 1780, was named for Thomas Harrison, the owner of the land on which it was located. It serves a thriving agricultural region where dairy products, corn, wheat, and especially poultry, are the chief products. Here is the largest poultry-fattening plant in the country. Here, too, are flourishing mills, creameries, cheese factories, wood-using factories, marble and granite works, and an incubator factory. The city has three colleges, State Teachers College for Women, Bridgewater College, and Shenandoah College.

HOPEWELL (F-4), (11,327), (N. & W. R. R.), bears the name of the *Hopewell*, the ship which sailed up the river from Jamestown after the massacre of 1622 to drive away the Indians who were molesting settlers at City Point. In the early days it was an important port for Petersburg and Richmond, and since 1914 it has again taken an important place among Virginia cities. Hopewell is becoming a center for the South's newest development in chemical plants. Among its important manufactured products are silks, pottery, paper, boxboard, and cellulose.

LYNCHBURG (D-4), (40,661), (James River; airport; Sou., C. & O., N. & W. R. Rs.), originated (1786) as a ferry crossing on the James River and was named for its founder, John Lynch. The city is the largest shoe manufacturing center in the South and also has the South's largest rayon plant. Other industries include the manufacture of pipe, shirtings, hosiery, plows, and paper. Here is located Randolph-Macon College, Lynchburg College, and Sweet Briar College.

***MARTINSVILLE** (D-5), (7705), (airport; D. & W., N. & W. R. Rs.; buses), incorporated in 1873, was named for General Joseph Martin, a revolutionary soldier who lived there. The town was settled in the gradual movement from the Tidewater Region to the mountains. The city is an important trade center for leaf and manufactured tobacco and is said to be the largest furniture-manufacturing center in Virginia and the second largest in the South. Among the city's important industries are lumber and wood working and cotton and silk mills.

NEWPORT NEWS (G-5), (34,417), (C. & O. R. R.), settled by Irish colonists as early as 1621, dates as a modern city from 1880 when it was chosen as the deep-water terminal for the Chesapeake and Ohio railway system. The town was incorporated in 1896. It was probably named for Captain John Smith's associate, Captain Newport, who carried both supplies and "news" between the Old and the New World. Newport News lies on the north side of the James River and Hampton Roads. It is connected with the south shore of the river by the James River Bridge, said to be the world's longest "all-over-water" bridge. Its piers are capable of receiving large ships and of loading coal, grain, and general freight. Its grain elevator has a capacity of 1,000,000 bushels. It boasts the largest shipbuilding plant in the world. The city has many other industries.

NORFOLK (G-5), (129,710), (Hampton Roads, Elizabeth River; airport; Sou., Vir., A. C. L., Pa., N. & W., C. & O., S. A. L., N. S. R. Rs.; buses), together with Portsmouth make up the Norfolk-Portsmouth Metropolitan Area, with a population of approximately 300,000, the largest metropolitan area in Virginia. The city is the largest coal port and the leading tobacco port in America. It is the fourth largest cotton port of the United States and one of the great fuel-oil ports of the world. The ice-free harbor—Hampton Roads—ample in size, at least 40 feet in depth, and well-protected from the rough water of the open sea, has helped to bring at least 50 steamship lines to serve the port of Norfolk and connect it with every country in the world.

The Norfolk Naval Base and the Norfolk Navy Yard (on the Portsmouth side of the water) make up Norfolk's leading industry. Shipbuilding, other than naval vessels, is also an important industry. Norfolk's industries also include a great range of activities such as silk-weaving, fertilizer factories, coffee roasting, peanut-cleaning, and tobacco stemming.

Norfolk was founded in 1682 that "it might be one of the stations where tobacco might be received, stored, and sold." It became a city in 1705, and Colonel Byrd said, "Norfolk in 1728 was a maritime city doing an extensive trade with the West Indies in beef, flour, pork, and lumber." Today Norfolk is one of the world's great ports, an important manufacturing city, and a shore resort.

Included in the Norfolk-Portsmouth area is South Norfolk. This city has industries essentially similar to those of Norfolk.

PETERSBURG (F-4), (28,564), (airport; N. & W., A. C. L., S. A. L. R. Rs.; buses; boat lines), is located on the Appomattox River at the fall line. Fort Henry, which was built in 1646 by Governor Sir William Berkeley, stood where the city now stands. Later this was leased to Major Peter Jones and came to be known as "Peter's Point." When the city was laid out along with Richmond by William Byrd, the city took the name of Petersburg.

Petersburg exceeds any city in the world in the manufacture of trunks and bags. In addition to luggage the city manufactures

artificial silk, fountain pens and pencils, peanut and tobacco products, and lumber. The city is in a rich agricultural region and serves as a distributing point for truck, tobacco, peanuts, and corn.

Petersburg, next to Yorktown, was the most important place in the Virginia campaign of 1781, and again played a leading military role in 1864 in the War Between the States. Here we find Petersburg National Military Park, Bollingbrook, used by General Philips as his headquarters in 1781, and the old Wallace Mansion, where Lincoln met Grant after Lee's evacuation.

Southern College and Virginia State College for Negroes is located here.

*PORTSMOUTH (G-5), (45,704), (Elizabeth River; Sou., S. A. L., Vir., Pa., A. C. L., C. & O. R. Rs.; boat lines), is a port of the Norfolk-Portsmouth Metropolitan Area and shares with Norfolk the advantages of the great harbor of Hampton Roads.

Portsmouth is a port "where rail and sail meet" and has large terminals (page 35) for the handling of freight between ship and train. Here, also, is a United States Navy Yard. The city manufactures paper, cotton goods, hosiery, fertilizer, and many other products. The chief business, however, is trade and shipping. Portsmouth takes its name from Portsmouth, England.

*PULASKI (C-4), (7168), (N. & W. R.R.) the largest town between Bristol and Roanoke, is in the center of the Valley Anthracite Fields. It is surrounded by a diversified farming area for which it is the wholesale trade and outlet center. Its industries include furniture and cheese factories, chemical works, coal, iron, and zinc mines.

RADFORD (C-4), (6227), (N. & W. R. R.; bus lines), situated on the banks of the New River, is an industrial city. The first settlement near the present city was made at Ingles Ferry in 1755. Radford was known as Central Depot until its incorporation in 1885, when it was named after Dr. John B. Radford, an outstanding citizen. The city's manufactures include cast-iron pipe, treated ties and railroad timber, tanning extracts, and crushed stone. The outstanding educational institution is the State Teachers College.

*RICHMOND (F-4), (182,929), (James River; R. E. Byrd Flying Field; Sou., C. & O., A. C. L., S. A. L., R. F. & P. R. Rs.; boat lines), capital of Virginia, was founded in 1737 by William E. Byrd, II (ancestor of Admiral Richard E. Byrd), and named by him probably for Richmond on the Thames in England, a city similarly placed. Located at the falls where the "water falleth so rudely and with such violence that not any boat can possibly passe," the settlement early became an important center for manufacture and commerce. Here the first coal was mined in America, the first iron and bricks were made, and here the great American tobacco industry had its beginnings. In 1779 the city became the capital of the state and later, during the War Between the States, capital of the Confederate States.

Today, Richmond is a great manufacturing and trading center. The factories of the city, more than 300 in number, represent about 50 kinds of industry. First in importance is the manufacture of tobacco products, second is paper and paper products, third is printing and publishing, and fourth are the iron and steel industries. Other industries of peculiar interest are factories for the manufacture of rayon and a plant which makes baseball bats. Indeed, there are few articles which cannot be manufactured profitably in Richmond.

Located about 100 miles up the James River from the sea is the Port of Richmond, for which a channel of 25 feet in depth has been planned to Hampton Roads. Richmond is a fresh-water port, and vessels using it have the advantage of voyaging farther inland before they must break bulk and transfer cargo to railroads or other carrier.

Within fifteen minutes of the center of the city by automobile is the R. E. Byrd Flying Field—the airport of Richmond. Planes may be taken from this port to any part of North or South America served by commercial air lines.

ROANOKE (C-4), (69,206), (Staunton River; Vir., N. & W. R. Rs.; buses), lies between the Blue Ridge and the Allegheny Mountains at the junction of several old Indian trails, and of highways down the Valley of Virginia and east and west from Tidewater Virginia to Kentucky and Tennessee. Prior to 1882 the community was known as Big Lick, from the salt marshes near by to which cattle and wild game came.

The city is the gateway and distributing point for a great mountain empire, and is also a mountain resort. In the vicinity are valley lands planted to crops, mountain lands covered with forests, and mines of coal and other minerals. These industries furnish some of the raw materials for the city's many factories which produce rayon fabrics, railroad equipment, structural iron and bridges, tin cans, and many other products.

Here are Hollins College and Roanoke College.

SOUTH NORFOLK (see **NORFOLK.**)

***STAUNTON** (D-3), (11,900), (B. & O., C. & O. R. Rs.), was chartered in 1749, and named after Lady Staunton, wife of Governor Gooch. This is the largest city in the Great Valley region and is in the center of farming land famous for fine wheat, livestock, and fruit. Included in the industries of Staunton are flour milling and clothing and furniture manufacturing. As an educational center the city has few equals. Here are Staunton Military Academy, Augusta Military College, Mary Baldwin College, Stuart Hall, and Virginia School for the Deaf and Blind.

***SUFFOLK** (G-5), (10,271), (Sou., Vir., A. C. L., S. A. L., N. & W., N. S. R. Rs.; boat lines), was established in 1742 at Constance's Warehouse. The city is in the Hampton Roads Port group, connected with Hampton Roads by the Nansemond River. It is a railroad center of importance and its location in the midst of the peanut-growing section gives it the distinction of being the greatest peanut market in the world. The city also has oyster- and meat-packing plants and includes the working of marl, brick-clay, and sand pits in its industries.

WAYNESBORO (E-3), (6226), (airport; N. & W., C. & O. R. Rs.), was founded in 1797 and was named for "Mad Anthony Wayne" of Revolutionary fame. The city manufactures rayon, electric appliances, furniture, silk products, ship fittings, pipe-organ parts, and church furniture. It is said to be the largest manufacturing town in the Shenandoah Valley. The city has two nationally known private schools, Fairfax Hall and Fishburne Military School.

***WINCHESTER** (E-2), (10,855), (airport; B. & O., Pa., W. & W. R. Rs.), was organized in 1752, but as early as 1638 there were houses on the site. The city was named after Winchester, England. It is the second oldest city in Virginia and has the largest apple by-product plant and the largest vinegar plant in the world, as well as being the largest apple cold-storage center in the East. The city's Apple Blossom Festival annually attracts thousands of visitors. The surrounding districts specialize in the growing of apples.

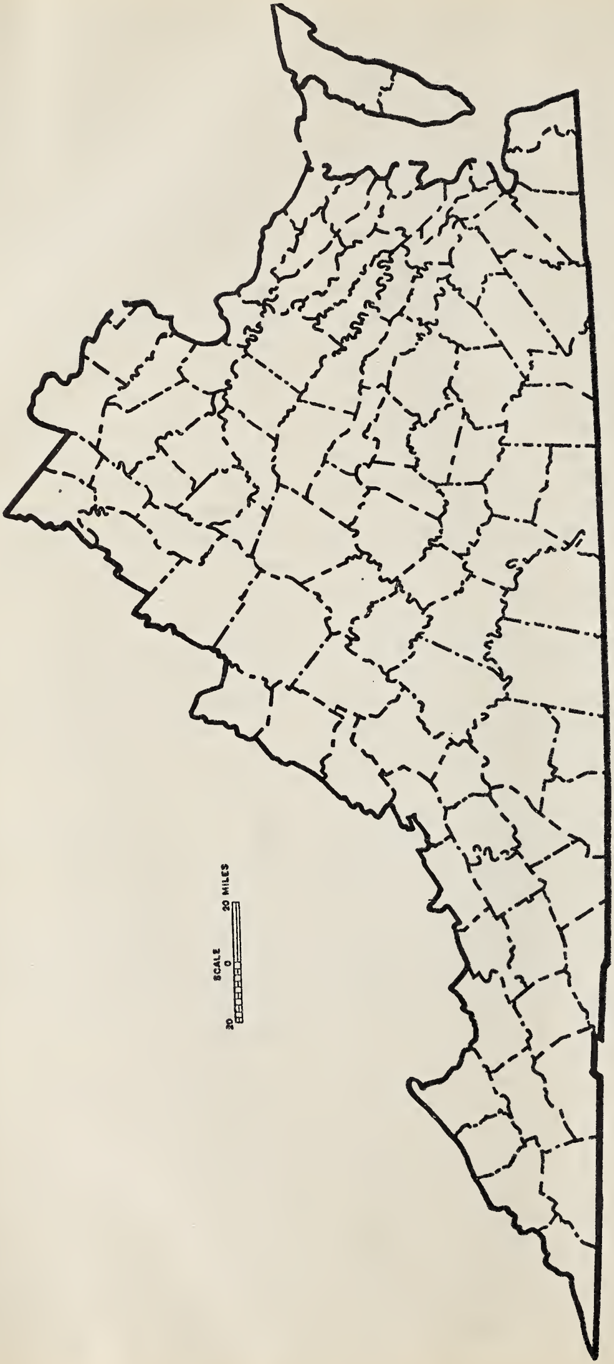

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TABLE I. COUNTIES AND COUNTY SEATS

County or Independent City	Area, Sq. Mi.	Population 1930	Population 1920	Population 1910	County Seat	Map Finder	Population 1930	Population 1920
Accomac	502	35,854	34,795	36,650	Accomac	H-4	......	......
Albemarle	747	26,981	26,005	29,871	Charlottesville	E-3	15,245	10,688
†Charlottesville	4	15,245	10,688	6,765	....	E-3	......	......
Alleghany	457	20,188	15,332	14,173	Covington	D-4	6,538	5,623
†Clifton Forge	1	6,839	6,164	5,748	....	D-4	......	......
Amelia	371	8,979	9,800	8,720	Amelia C. H.	F-4	......	......
Amherst	470	19,020	19,771	18,932	Amherst	D-4	876	559
Appomattox	342	8,402	9,255	8,904	Appomattox	E-4	704	......
Arlington	25	26,615	16,040	10,231	Fort Myer Heights	F-3	......	......
†Alexandria	8	24,149	18,060	15,329	....	F-3	......	......
Augusta	1,003	38,163	34,671	32,445	Staunton	D-3	11,990	10,623
†Staunton	3	11,990	10,623	10,604	....	D-3	......	......
Bath	545	8,137	6,389	6,538	*Warm Springs	D-3	1,881	1,462
Bedford	791	29,091	30,669	29,549	Bedford	D-4	3,713	3,243
Bland	360	6,031	5,593	5,154	Bland	B-4	......	......
Botetourt	548	15,457	16,557	17,727	Fincastle	D-4	517	457
Brunswick	557	20,486	21,025	19,244	Lawrenceville	F-5	1,629	1,439
Buchanan	514	16,740	15,441	12,334	Grundy	A-4	815	394
Buckingham	584	13,315	14,885	15,204	Buckingham	E-4	92	109
Campbell	544	22,885	26,716	23,043	Rustburg	D-4	4,829	4,785
†Lynchburg	13	40,661	30,070	29,494	....	D-4	......	......
Caroline	529	15,263	15,954	16,596	Bowling Green	F-3	422	463
Carroll	458	22,141	21,283	21,116	Hillsville	C-5	485	......
Charles City	188	4,881	4,793	5,253	Charles City	F-4	......	......
Charlotte	496	16,061	17,540	15,785	Charlotte C. H.	E-4	366	318
Chesterfield	469	26,049	20,496	21,299	Chesterfield	F-4	......	......
Clarke	171	7,167	7,165	7,468	Berryville	F-2	1,094	1,138
Craig	333	3,562	4,100	4,711	Newcastle	C-4	259	702
Culpeper	384	13,306	13,292	13,472	Culpeper	F-3	2,379	1,819
Cumberland	293	7,535	9,111	9,195	Cumberland	E-4	......	......
Dickenson	325	16,163	13,542	9,199	Clintwood	A-4	729	460
Dinwiddie	517	18,492	17,949	15,442	Dinwiddie	F-4	......	......
†Petersburg	4	28,564	31,012	24,127	....	F-4	......	......
Elizabeth City	53	19,835	19,111	15,720	Hampton	G-4	6,382	6,138
†Hampton	1	6,382	6,138	5,505	....	G-4	......	......
Essex	258	6,976	8,542	9,105	Tappahannock	G-4	427	422
Fairfax	416	25,264	21,943	20,536	Fairfax	F-3	640	516
Fauquier	666	21,071	21,869	22,526	Warrenton	F-3	1,450	1,545
Floyd	376	11,698	13,115	14,092	Floyd	C-5	450	390
Fluvanna	285	7,466	8,547	8,323	*Palmyra	E-4	1,422	1,673
Franklin	697	24,337	26,283	26,480	Rocky Mount	D-5	1,339	1,076
Frederick	431	13,167	12,461	12,787	Winchester	E-2	10,855	6,883
†Winchester	4	10,855	6,883	5,864	....	E-2	......	......
Giles	369	12,804	11,901	11,623	Pearisburg	C-4	668	537
Gloucester	223	11,019	11,894	12,477	Gloucester	G-4	......	......
Goochland	287	7,953	8,863	9,237	Goochland	F-4	......	......
Grayson	425	20,017	19,816	19,856	Independence	B-5	......	......
Greene	155	5,980	6,369	6,937	Standardsville	E-3	229	......
Greensville	307	13,388	11,606	11,890	Emporia	F-5	2,144	1,869
Halifax	814	41,283	41,374	40,044	Halifax	E-5	473	411
Hanover	512	17,009	18,088	17,200	Hanover	F-4	......	......
Henrico	255	30,310	18,972	23,437	Richmond	F-4	182,929	171,667
†Richmond	24	182,929	171,667	127,628	....	F-4	......	......
Henry	442	20,088	20,238	18,459	Martinsville	D-5	7,705	4,075
†Martinsville	2	7,705				D-5		
Highland	422	4,525	4,931	5,317	Monterey	D-3	290	313
Isle of Wight	314	13,409	14,433	14,929	Isle of Wight	G-5	......	......
James City	163	3,879	3,676	3,624	Williamsburg	G-4	3,778	2,462
†Williamsburg	1	3,778	2,462	2,714	....	G-4	......	......
King and Queen	320	7,618	9,161	9,576	King and Queen Court House	G-4	......	......
King George	180	5,297	5,762	6,378	King George	F-3	......	......
King William	263	7,929	8,739	8,547	King William	F-4	......	......
Lancaster	130	8,896	9,757	9,752	Lancaster	G-4	......	......

† Independent city.

* District, not incorporated.

TABLE I. COUNTIES AND COUNTY SEATS (*Continued*)

County or Independent City	Area, Sq. Mi.	Population			County Seat	Map Finder	Population	
		1930	1920	1910			1930	1920
Lee	446	30,419	25,293	23,840	Jonesville	A-1	384	328
Loudoun	519	19,852	20,577	21,167	Leesburg	F-2	1,640	1,545
Louisa	516	14,309	17,089	16,578	Louisa	F-3	301	289
Lunenburg	430	14,058	15,260	12,780	Lunenburg	E-5	......	......
Madison	324	8,952	9,595	10,055	Madison	E-3	......	......
Mathews	94	7,884	8,447	8,922	Mathews	G-4	......	......
Mecklenburg	669	32,622	31,208	28,956	Boydton	E-5	492	457
Middlesex	146	7,273	8,157	8,852	*Saluda	G-4	2,731	2,841
Montgomery	396	19,605	18,595	17,268	Christiansburg	C-4	1,970	1,641
†Radford	5	6,227	4,627	4,202	....	C-4	......	......
Nansemond	421	22,530	20,199	26,886	Suffolk	G-5	10,271	9,123
†Suffolk	2	10,271	9,123			G-5	......	......
Nelson	473	16,345	17,277	16,821	*Lovingston	E-4	6,289	6,369
New Kent	191	4,300	4,541	4,682	New Kent	G-4	......	......
Norfolk	373	30,082	57,358	52,744	Portsmouth	G-5	45,704	54,387
†South Norfolk	2	7,857						
†Norfolk	28	129,710	115,777	67,452	....	G-5	......	......
†Portsmouth	5	45,704	54,387	33,190	....	G-5	......	......
Northampton	239	18,565	17,852	16,672	Eastville	H-4	351	332
Northumberland	205	11,081	11,518	10,777	*Heathsville	G-4	2,268	2,460
Nottoway	310	14,866	14,161	13,462	Nottoway	E-4	......	......
Orange	359	12,070	13,320	13,486	Orange	E-3	1,381	1,078
Page	322	14,852	14,770	14,147	Luray	E-3	1,459	1,381
Patrick	485	15,787	16,850	17,195	Stuart	C-5	588	401
Pittsylvania	1,012	61,424	56,493	50,709	Chatham	D-5	1,143	1,171
†Danville	3	22,247	21,539	19,020	....	D-5	......	......
Powhatan	273	6,143	6,552	6,099	Powhatan	F-4	......	......
Prince Edward	356	14,520	14,767	14,266	Farmville	E-4	3,133	2,586
Prince George	289	10,311	12,915	7,848	Prince George	F-4	......	......
†Hopewell	5	11,327	1,397		....	F-4	......	......
Princess Anne	285	16,282	13,626	11,526	Princess Anne	G-5	......	......
Prince William	345	13,951	13,660	12,026	Manassas	F-3	1,215	1,305
Pulaski	333	20,566	17,111	17,246	Pulaski	C-4	7,168	5,282
Rappahannock	274	7,717	8,070	8,044	Washington	E-3	250	233
Richmond	204	6,878	7,434	7,415	Warsaw	G-4	......	......
Roanoke	295	35,289	22,395	19,623	Salem	C-4	4,833	4,159
†Roanoke	10	69,206	50,842	34,874	....	C-4	......	......
Rockbridge	611	20,902	20,626	21,171	Lexington	D-4	3,752	2,870
†Buena Vista	5	4,002	3,911	3,245	....	D-4	......	......
Rockingham	874	29,709	30,047	34,903	Harrisonburg	E-3	7,232	5,875
†Harrisonburg	2	7,232	5,875		....	E-3	......	......
Russell	496	25,957	26,786	23,474	Lebanon	A-5	560	469
Scott	543	24,181	24,776	23,814	Gate City	B-1	1,216	684
Shenandoah	510	20,655	20,808	20,942	Woodstock	E-3	1,552	1,580
Smyth	435	25,125	22,125	20,326	Marion	B-5	4,156	3,253
Southampton	604	26,870	27,555	26,302	Courtland	F-5	355	379
Spotsylvania	412	10,056	10,571	9,935	Spotsylvania	F-3	......	......
†Fredericksburg	1	6,819	5,882	5,874	....	F-3	......	......
Stafford	274	8,050	8,104	8,070	Stafford	F-3	......	......
Surry	278	7,096	9,305	9,715	Surry	G-4	243	......
Sussex	515	12,100	12,834	13,664	Sussex	F-5	......	......
Tazewell	531	32,477	27,840	24,946	Tazewell	B-4	1,211	1,261
Warren	216	8,340	8,852	8,589	Front Royal	E-3	2,424	1,404
Warwick	65	8,829	11,417	6,041	*Denbigh	G-4	1,329	1,228
†Newport News	4	34,417	35,596	20,205	....	G-5	......	......
Washington	602	33,850	32,376	32,830	Abingdon	B-5	2,877	2,532
†Bristol	2	8,840	6,729	6,247	....	A-5	......	......
Westmoreland	252	8,497	10,240	9,313	*Montross	G-3	1,893	2,158
Wise	420	51,167	46,500	34,162	Wise	B-1	1,112	1,071
Wythe	479	20,704	20,217	20,372	Wytheville	B-5	3,327	2,947
York	136	7,615	8,046	7,757	Yorktown	G-4	480	155

† Independent city. * District, not incorporated.

TABLE II. SOME PLACES OF HISTORIC AND SCENIC INTEREST IN VIRGINIA

NAME	LOCATION	DESCRIPTION
Arlington National Cemetery	Arlington	National Military Cemetery
Ash Lawn	near Charlottesville	home of James Monroe
Capitol, first	Williamsburg	
Capitol of Virginia	Richmond	
Chincoteague Island	on Atlantic Coast along Eastern Shore	wild pony roundups
College of William and Mary	Williamsburg	second oldest college in America
Confederate Museum	Richmond	White House of the Confederacy
Crystal Caverns	near Strasburg	
Crystal Spring	Roanoke	
Dismal Swamp	Nansemond and Norfolk counties	
Endless Caverns	south of New Market	
Farmville State Teachers College	Farmville	the oldest school maintained by the state for higher education of women
Fortress Monroe	Old Point Comfort	Jefferson Davis was imprisoned here after the War Between the States
Gadsby's Tavern	Alexandria	Washington's Headquarters in 1754
Grand Caverns	near Burketown	
Hampton Roads	Atlantic Coast	world's finest harbor
Hollins College	north of Roanoke	first chartered school for women in Virginia
Hot Springs	Hot Springs	resort
Jamestown	James River	site of first permanent English settlement
Langley Field	near Hampton	America's greatest flying school
Lighthouse	Cape Henry	site of landing of first English settlers
Locust Hill	Ivy	birthplace of Meriwether Lewis
Luray Caverns	east of New Market	
Maury House	Fredericksburg	home of Matthew Fontaine Maury
Monticello	near Charlottesville	home of Thomas Jefferson
Montpelier	near Ashland	home of James Madison
Moore House	Yorktown	scene of surrender of Lord Cornwallis
Mountain Lake	near Newport	on one of the highest mountains in Virginia
Mount Vernon	on Potomac near Alexandria	home of George Washington
Natural Bridge	Natural Bridge	
Natural Bridge Forest	near Natural Bridge	
Natural Tunnel	near Clinchport	
Oak Hill	near Warrenton	home of Chief Justice John Marshall
Presbyterian Parsonage	Staunton	birthplace of Woodrow Wilson
Raleigh Tavern	Williamsburg	
Saint John's Church	Richmond	scene of Patrick Henry's famous speech
Shenandoah Caverns	north of New Market	
Stoneleigh	Harrisonburg	home of Dr. Walter Reed
Stratford	near Fredericksburg	birthplace of Robert E. Lee
U. S. Navy Yard	Portsmouth	
University of Virginia	Charlottesville	
Wakefield	near Fredericksburg	birthplace of George Washington
Walnut Hill	south of Staunton	home of Cyrus McCormick
Warm Springs	Warm Springs	resort
Washington and Lee University	Lexington	
Westover	near Richmond	home of Colonel William Byrd, II

TABLE III. MINERAL PRODUCTS (1933)

Product	Unit	Quantity	Value
Coal	tons	8,178,642	$10,029,000
Stone	tons	2,096,750	2,302,125
Sand and gravel	tons	1,461,059	1,168,234
Clay products	....	....	1,089,297
Lime	tons	84,597	487,957
Coke	tons	70,493	243,475
Slate	....	....	84,126
Manganese ore	tons	4,882	74,050
Feldspar (crude)	tons	13,459	52,758
Talc and ground soapstone	tons	9,348	40,058

TABLE IV. AGRICULTURAL PRODUCTS

Product	Unit	1934	1929
Wheat	bu.	7,895,683	8,575,461
Oats	bu.	767,678	1,127,824
Barley	bu.	1,030,193	331,884
Rye	bu.	581,770	440,334
Corn	bu.	29,910,532	32,772,810
Cotton, lint	bales	35,977	52,442
Tobacco	lbs.	79,009,028	115,825,610
Irish potatoes	bu.	13,397,138	15,244,216
Sweet potatoes and yams	bu.	3,863,286	5,042,596
Hay crops	tons	904,173	980,737

TABLE V. FISHERIES OF VIRGINIA

Species	Pounds	Value
Menhaden	195,485,600	$652,536
Alewives	19,177,448	86,766
Croaker	14,235,182	186,720
Sea Trout	12,474,553	243,978
Shad	4,847,487	424,316
Drum	2,734,707	46,702
Butterfish	2,285,352	55,203
Flounders	1,083,413	52,031
Catfish and bullheads	718,408	22,351
Spot	716,665	18,010
Bluefish	684,359	27,029
Striped Bass	518,900	63,474
Shellfish		
Crabs	25,979,332	427,249
Oysters	13,467,772	937,055
Clams	1,169,266	264,258
Scallops	72,645	8,094

TABLE VI. PRINCIPAL VEGETABLES

Product	Value (1930)
Beans, snap or string	$777,346
Beans, lima	427,962
Cabbage	1,284,617
Canteloupes and muskmelons	164,939
Corn, sweet	276,966
Cucumbers	199,960
Kale	226,050
Onions	185,206
Peas	257,756
Spinach	763,115
Tomatoes	1,923,628
Watermelons	299,619
Total value of all vegetables	7,576,948

TABLE VII. LIVESTOCK AND POULTRY

	1935	1930
Cattle and calves	870,294	725,017
Horses and colts	162,633	200,896
Mules and mule colts	93,198	94,302
Sheep and lambs	437,625	828,526
Swine	543,233	699,867
Chickens (1935)	9,729,000	......

INDEX

Explanation of Symbols: Geographic and proper names are indexed in black-face type (**Alexandria**), other subjects in light-face (Accawmacke). Map references are given by italic figures in parentheses, with or without location, as (*3* F3) or (*36*). Illustrations are shown by italic figures with asterisk, **32*. All references are to page numbers.

Key to Pronunciation: āte, senāte, râre, căt, locȧl, fär, ȧsk, pȧrade; scēne, ēvent, ĕdge, novẹl, refẽr; rīght, sĭn; cōld, ōbey, côrd, stŏp, cŏmpare; ūnit, ūnite, bûrn, cŭt, focŭs, menü; bo͞ot, fo͝ot; found; boil; fu͡nction; chase; good; joy; *th*en, thick; **hw** = wh as in when; **zh** = z as in azure; **kh** = ch as in loch.

Yucatan - Q. 477

M.H.
F.J.R.
J.C.

Nothing [illegible]

up to 296 - 430

Barrans, Alta

~~Enterprise~~

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